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Railway Age

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FEBRUARY 4, 1933

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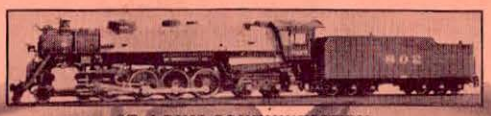
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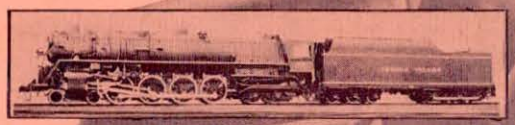
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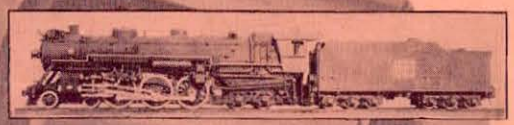
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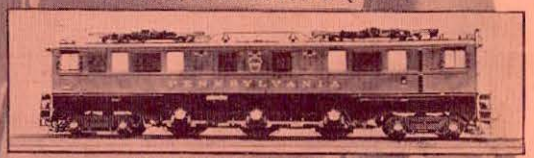
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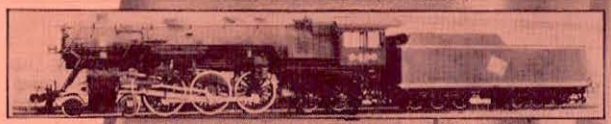
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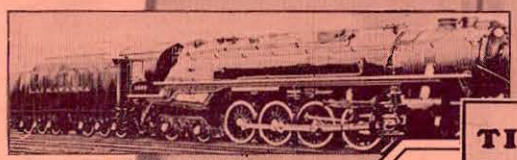
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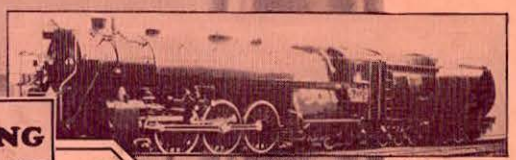
CANADIAN NATIONAL

Tapered Roller
TIMKEN BEARING EQUIPPED

On these railroads alone, 376 Timken-equipped locomotives are already in operation or on order. 161 of them are *completely* Timken-equipped—Timken Bearings on all axles. The experimental stages are long since passed, and railroads may confidently anti-frictionize—with Timken Bearings.

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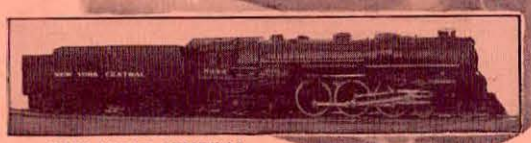
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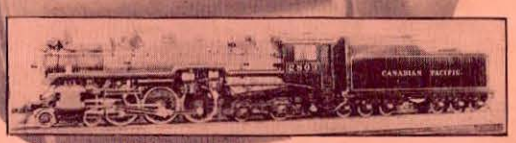
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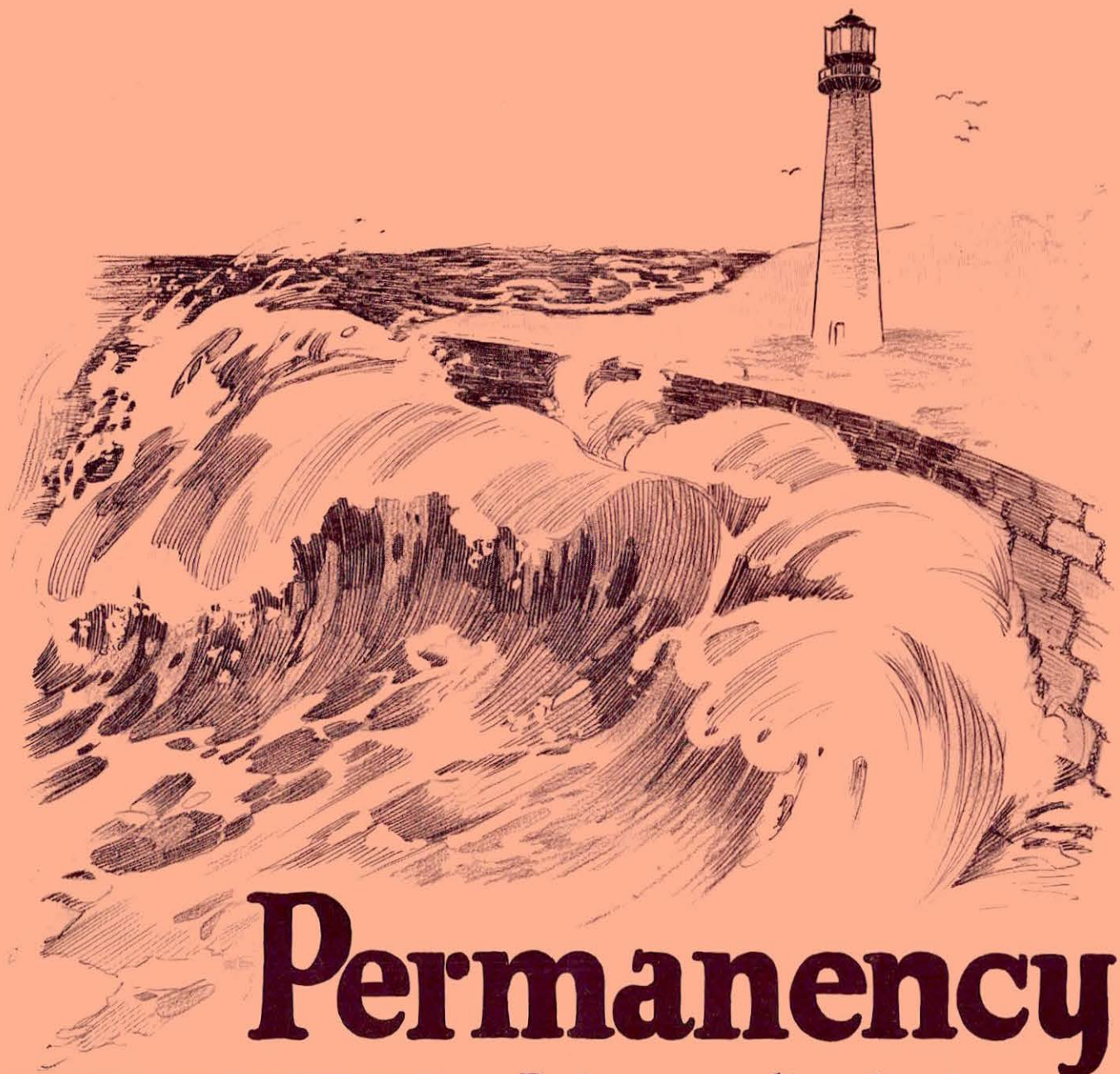
TIMKEN *Tapered Roller* BEARINGS



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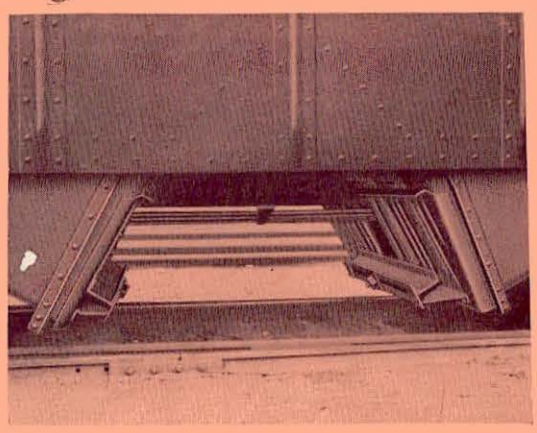

Resistance to distortion is an outstanding feature of

AJAX

CORRUGATED DROP DOORS

They reduce drop door failures.

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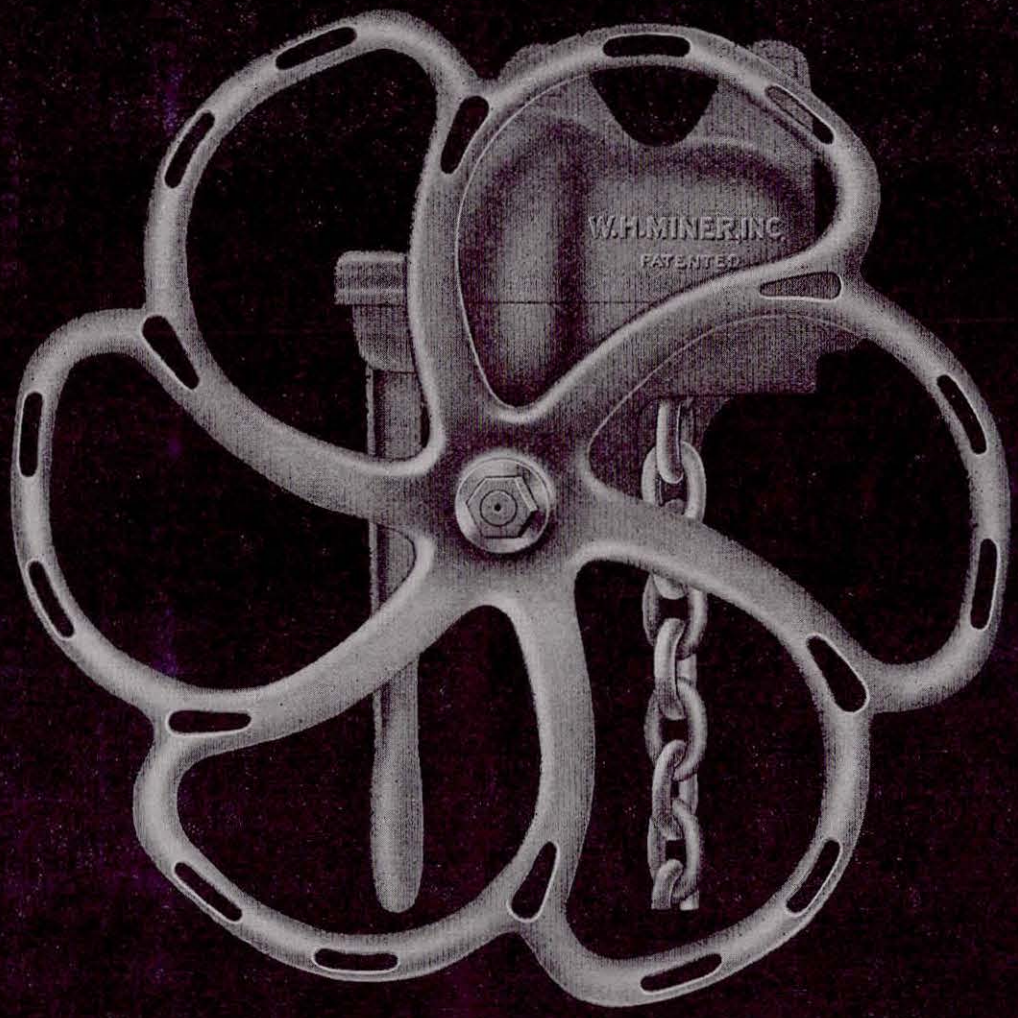

Embodies Highest Standards of Safety, Power and Efficiency

W. H. MINER, INC. CHICAGO

"No FACTOR bears a greater part today in the economical operation of locomotives than WATER"

. . . says CARL R. GRAY

BY improving the quality of locomotive boiler water through proper treatment, the life of locomotive fireboxes and flues has been doubled and in many cases tripled, while the average number of miles between engine failures due to boiler conditions is now more than five times as great as it was eight years ago.

Extensions beyond the Federal four-year limit on flues are being obtained with increasing frequency, together with mileages of more than a half-million miles.

The treatment of locomotive boiler water with Sodium Aluminate (Nalco System) produces actual tangible savings by decreasing shopping and maintenance costs, lowering fuel consumption, decreasing boiler washing and eliminating engine failures due to bad water.

★

A road with 1600 locomotives started using Sodium Aluminate in 1923. In that year its locomotive miles per failure due to water conditions were 412,599. In 1931, after the extension of Sodium Aluminate treatment to most of the system, this figure had been increased to 18,174,972 miles.

★

● The Nalco System includes the service and supervision by men trained in the application of Sodium Aluminate. It includes too, Nalco's research facilities and pioneer experience in the development of Sodium Aluminate Water Treatment.

NATIONAL ALUMINATE CORPORATION
6216 West 66th Place, Chicago, Illinois

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CENTRALIZED TRAFFIC CONTROL

affords the utmost facility, flexibility and economy in dispatching trains by eliminating delays, keeping tonnage trains moving and thus increasing average train speed and gross ton miles per train hour.

These Self Liquid

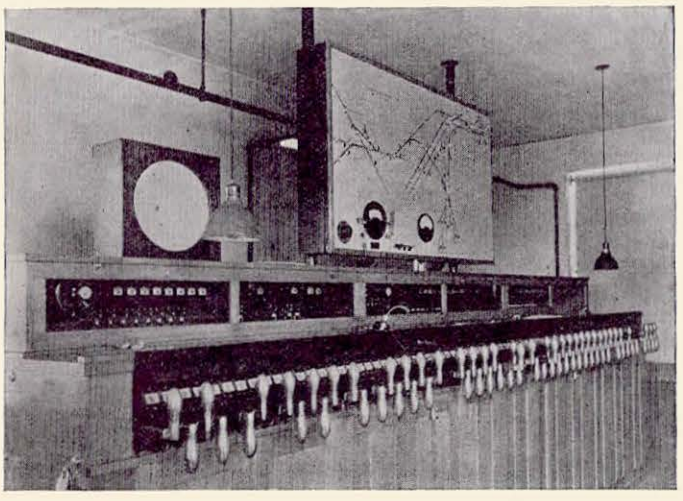
WILL SOON PAY FOR THEM-

CENTRALIZED TRAFFIC CONTROL
REMOTE CONTROL
INTERLOCKING CONSOLIDATIONS
CAR RETARDERS —

are modern systems which have been designed for the particular requirements of modern traffic conditions. Numerous installations of these systems on many railways have clearly demon-

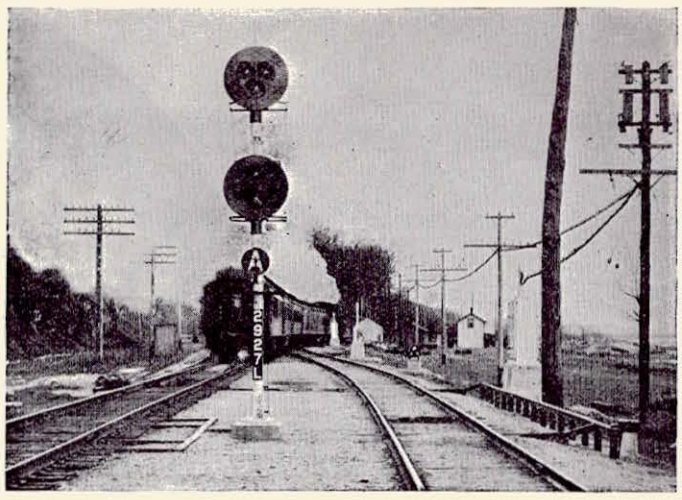
GENERAL RAILWAY

ROCHESTER,



INTERLOCKING CONSOLIDATIONS

afford many facilities and economies as, frequently, several plants some distance apart can be controlled from one convenient point and the expense of operating and maintaining one or more interlocking stations eliminated.



REMOTE CONTROL

affords a simple, convenient means of eliminating tonnage train stops at outlying switches such as passing sidings, ends of multiple track, junctions and similar layouts. Helps materially to keep tonnage trains moving.

-ating Systems

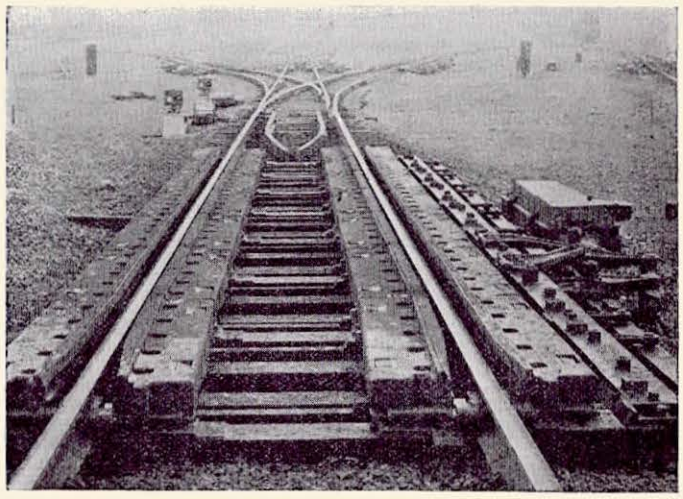
SELVES FROM SAVINGS EFFECTED

strated their utility and economy in simplifying and facilitating railway operation. Net savings up to 115 per cent on investment have been made.

There are, probably, many locations on your railway where one of these modern systems would give you better and cheaper operation. Now is the time to investigate. Our engineers are at your service without obligation.

SIGNAL COMPANY

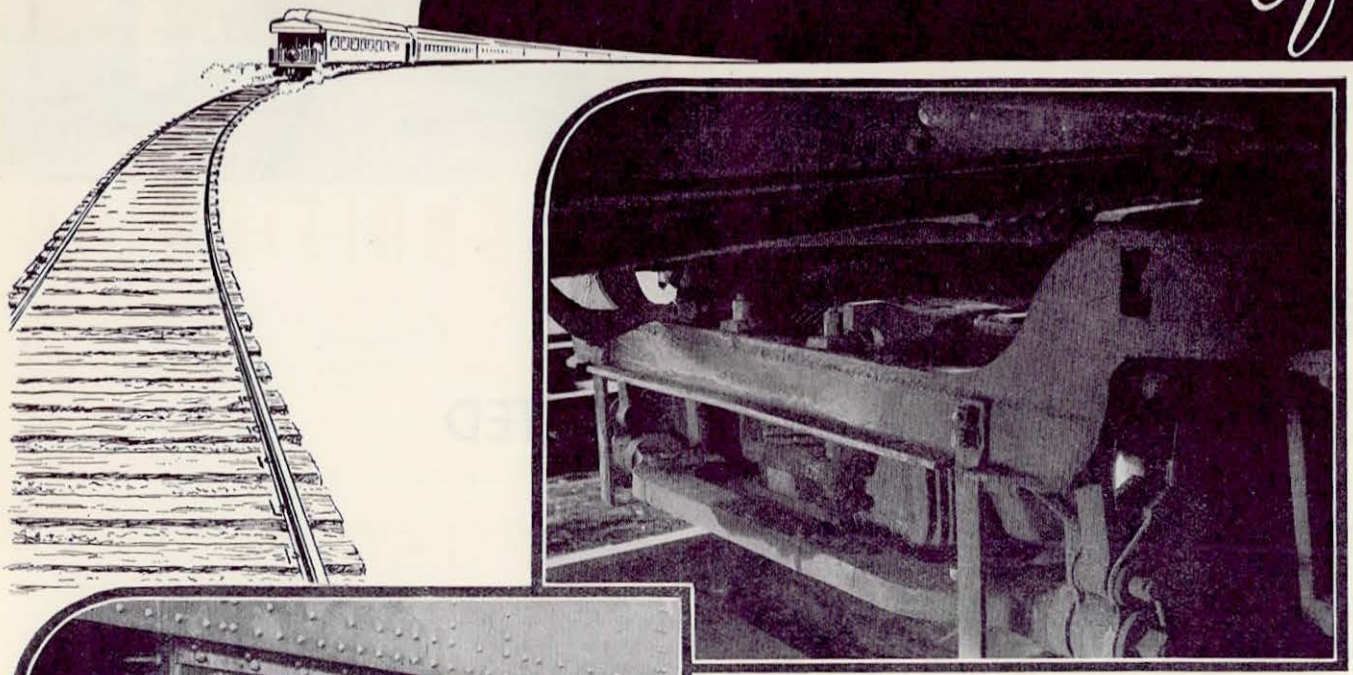
NEW YORK A-1141

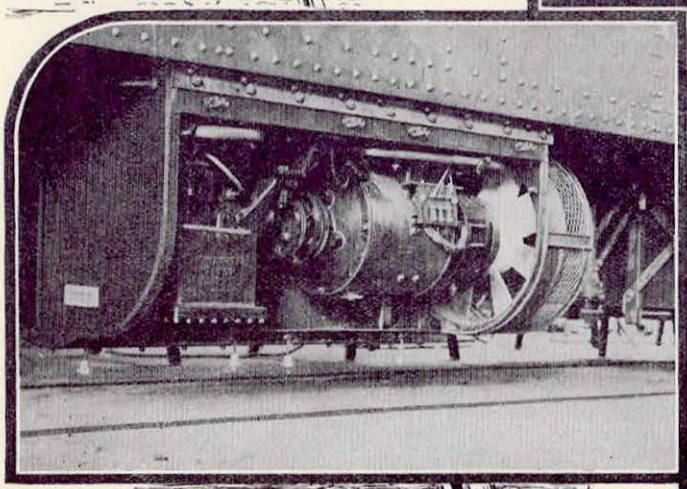


CAR RETARDERS

afford greater facility and economy in classifying cars at hump yards and result in a reduction in average car detention, lower costs per car and less yard locomotive hours.

600,000 of

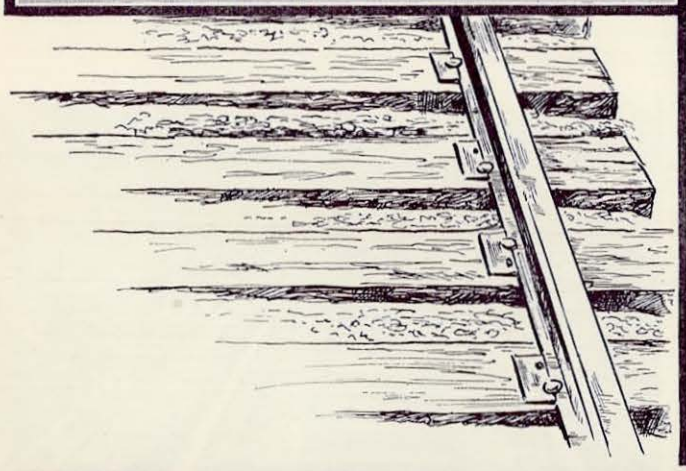


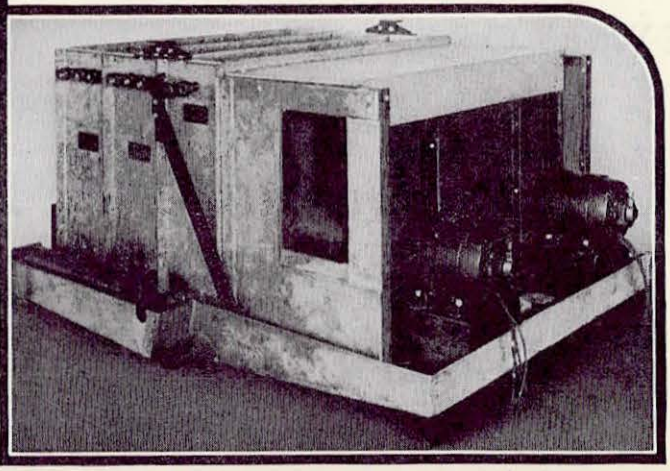


Above—This 15-kw. gear-driven Axle Generator supplies ample power for air conditioning, car lighting, and battery charging.

Left—The Refrigerating Unit mounts under the car floor. Its a-c.--d-c. motor makes possible the use of terminal a-c. power for pre-cooling of cars prior to departure.

Below—The Air Conditioning Unit, which fits into the car roof, cools, dehumidifies, and ventilates.





COMPLETE AIR CONDITIONING

CAR MILES *successful performance*

with

WESTINGHOUSE AIR CONDITIONING

IN June, 1932, ten cars, constituting the full requirements for both sections of the Illinois Central's "Daylight Special," operating between Chicago and St. Louis, were equipped with Westinghouse Air Conditioning. Since then this equipment has operated approximately 60,000 miles per car, or a total of *600,000 car miles of highly successful performance.*

This Illinois Central installation is not experimental. The equipment is standard Westinghouse railway air conditioning apparatus which was built only after successful laboratory and road tests had been completed.

Westinghouse provides the first and only system for railway air conditioning that is complete from rail to roof . . . all designed and guaranteed by a *single* manufacturer. It includes not only the air conditioning and refrigerating units but also the generating and controlling.

Westinghouse Air Conditioning equipment will fit any existing car without extensive alterations to the car structure. The entire system has been made extremely light-weight *without sacrificing the strength and ruggedness* necessary to withstand the severe shocks and stresses encountered in railway service . . . service under which ordinary equipment is expensive to maintain.

Your Westinghouse representative will be glad to help you arrange to inspect this equipment in service. For full information mail the coupon.

Westinghouse

Quality workmanship guarantees every Westinghouse product

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Gentlemen:
Your descriptive literature on Railway Air Conditioning, please.

Name .....
Company .....
Address .....
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EQUIPMENT — FROM RAIL TO ROOF

The AUXILIARY enables a Locomotive to rise to the Occasion

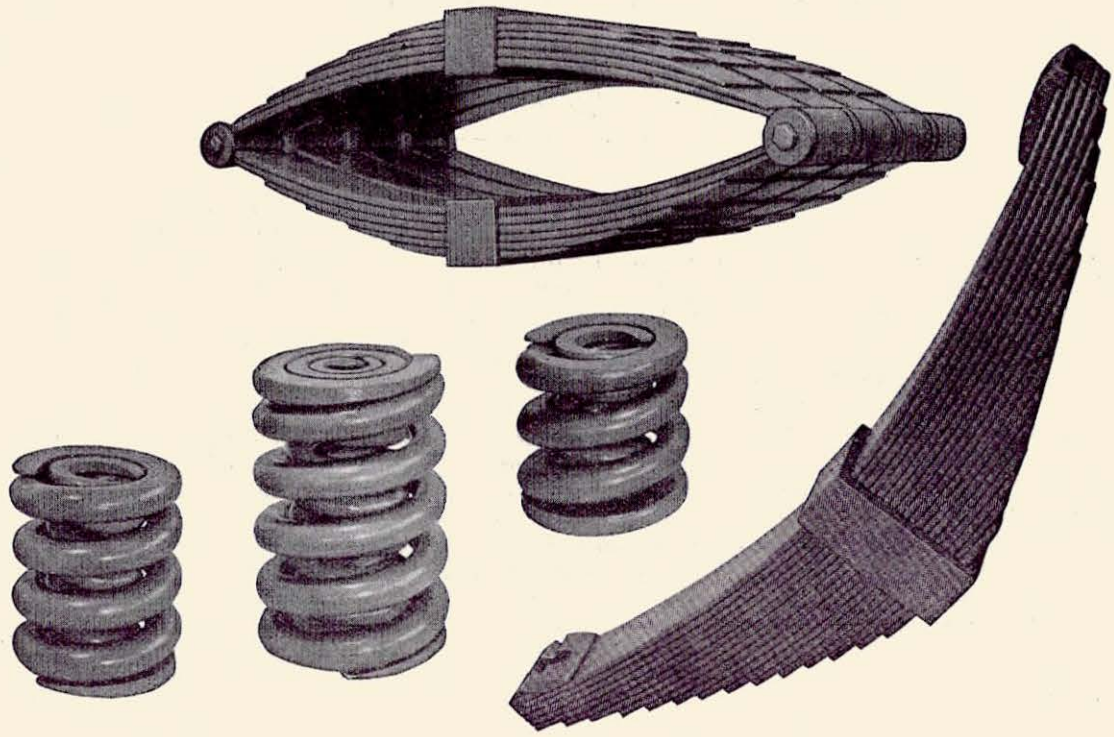
THE installation of a Bethlehem Auxiliary Locomotive under the tender, providing reserve tractive force amounting to from 10,000 to 18,000 pounds, greatly increases the flexibility of a locomotive and makes it much better able to cope with any situation that may arise. With this extra tractive force available for instant use when needed, train loads can be increased by 15 to 25 per cent, to a point at which they utilize the full power of the engine under usual running conditions. This naturally makes for efficient railroad operation.

The Auxiliary Locomotive attains its highest degree of usefulness on the high-wheel fast-freight engine. This type of engine, already available for passenger service, is made more effective in the fast-freight service for which it is primarily intended, and can be used, as well, in slow-freight service whenever conditions so dictate, with very satisfactory results.

BETHLEHEM AUXILIARY LOCOMOTIVE

BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa. *District Offices:* New York, Boston, Philadelphia, York, Wilkes-Barre, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo (Hamburg Turnpike, Lackawanna, N. Y.), Cleveland, Cincinnati, Indianapolis, Detroit, Chicago, St. Paul, Milwaukee, St. Louis, Houston, Dallas. *Pacific Coast Distributor:* Pacific Coast Steel Corporation, San Francisco, Los Angeles, Portland, Seattle, Honolulu. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

Quality Springs



During a third of a century the American Steel Foundries has built up a reputation for the designing and manufacturing of springs for railway equipment and industrial purposes. Its plant is equipped with complete modern facilities for double heat treatment of springs to meet the new standard specifications.

Old springs returned for repairs are reconditioned and given the same heat treatment as required by the specifications for new springs. Many railroads are finding it desirable and more economical to have old springs rebuilt in a plant with such facilities than to attempt the work in their own shops.

So important and essential is the dependable operation of springs for all purposes that the selection of a satisfactory source of supply deserves real thought and study.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

Turn Over that New Leaf—and You'll Find

ARMCO PRODUCTS

Under Thrifty Car Materials

Do what hundreds of railroad executives have decided upon for 1933—turn over a new leaf in the purchase of material for rolling stock.

There is no better, surer way of achieving real economy than with Armco Products. You are certain to get materials that have met rigid service tests and were found good—serviceable, dependable, inexpensive to install and maintain.

One of these products, Armco Wrought Steel Wheels, has been manufactured to exacting railroad standards since 1908. Despite the increasing severity of service, these carefully-made wheels are yielding relatively more mileage . . for which persistent development, intensive research, and advanced manufacturing practice are responsible.

But do not stop at wheels. Consider the smartened appearance that Armco flat-rolled products lend to car bodies, and the money they can save you through increased service and fewer repairs and replacements.

Among these durable, finely-finished products are locomotive jacket sheets that form easily, wear long, and preserve their polished or painted surfaces; special car siding sheets that reduce shop-working costs and hold paint firmly; freight car sheets and plates that diminish scrap waste and stand up remarkably well on the road; passenger car sheets and plates that finish beautifully and endure; full-weight galvanized "Paint-grip" sheets that take paint smoothly and lastingly and suppress rust-bills; hot and cold rolled iron and steel sheets for applications where even texture, uniform composition and ductility are required.

Profits are what you are driving for during this difficult period of reconstruction. Armco Railroad Products can help you reach that objective by returning extra service dividends—money that ordinarily you would spend for maintenance. They cost no more, initially, than "run-of-the-mill" products. We will welcome your inquiry. Just outline your needs to the nearest office listed below.

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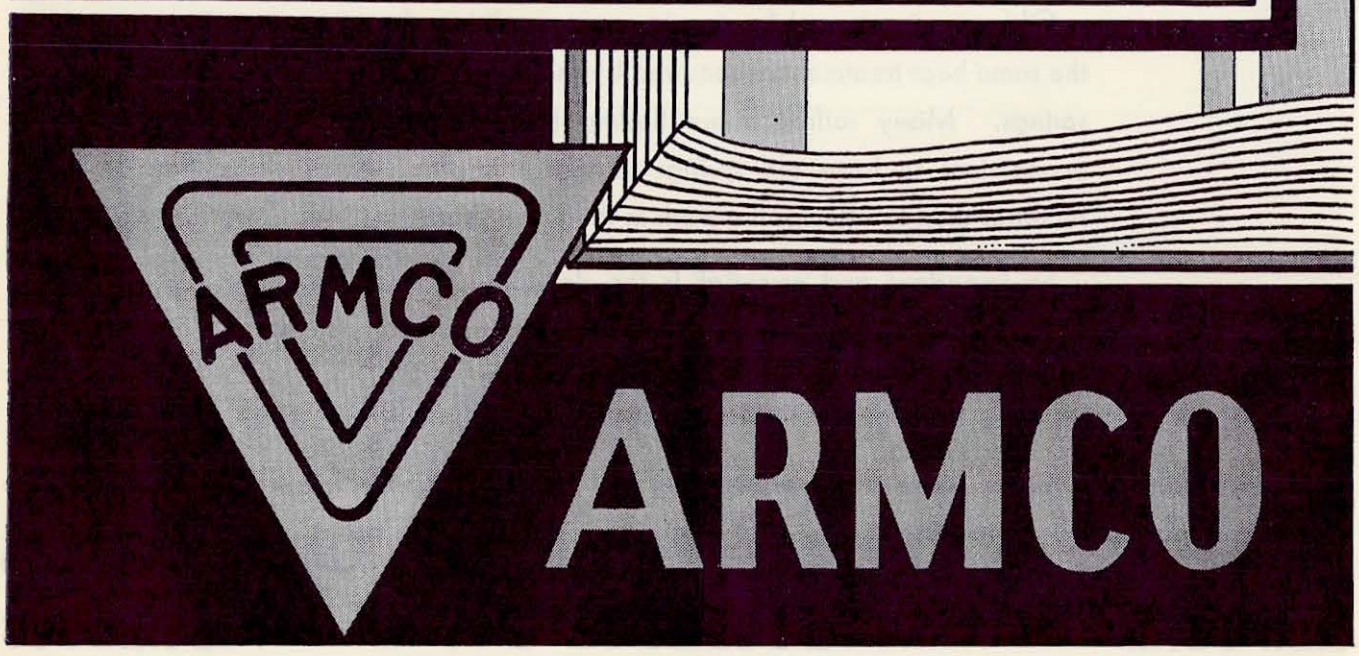

THRIFTY CAR MATERIALS

Build and Replace with these
ARMCO RAILROAD PRODUCTS

WROUGHT STEEL WHEELS
SPECIAL CAR SIDING SHEETS
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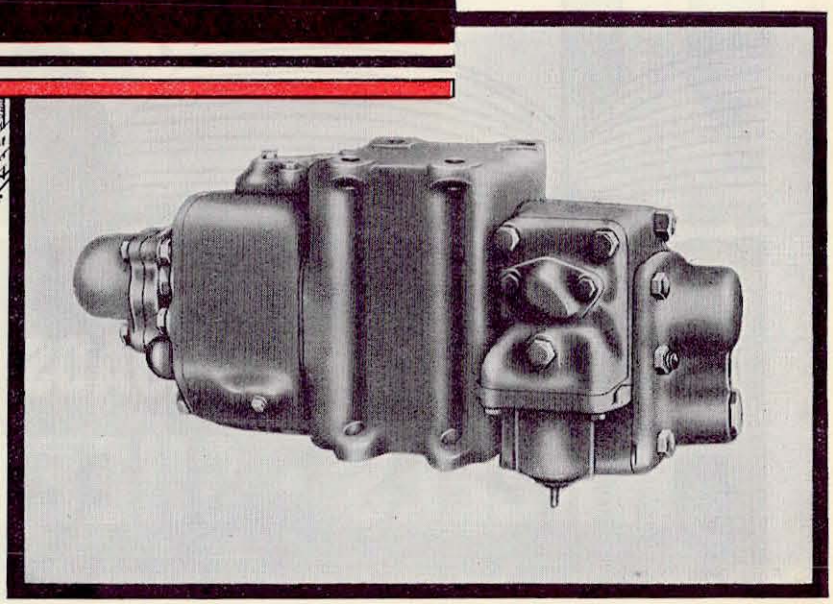
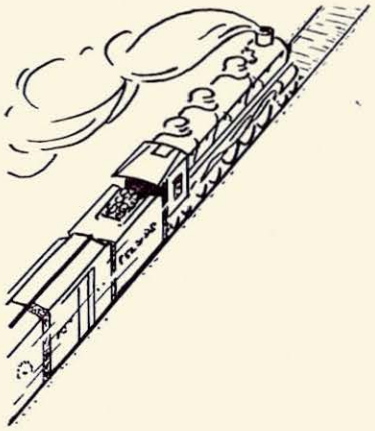
The WESTINGHOUSE AIR BRAKE CO. Announces

The NEW "A B" FREIGHT BRAKE





Provides Adequate, Uniform, Positive, and Reliable Control for Modern Freight Trains

IT HAS THE FOLLOWING DISTINCTIVE FEATURES

SERIAL brake action is twice as fast as heretofore possible.

Every brake in a long train will positively apply.

An effective cylinder pressure is always obtained.

Release of all brakes throughout a train following service or emergency application is quick and positive.

Emergency application can be obtained at any time.

Propagation of emergency action is the fastest ever produced pneumatically.

Flexible, positive control of cylinder pressure on grades is assured.

Positive protection against undesired emergency is provided.

A high brake cylinder pressure is obtained in emergency, and so developed as to assure smooth train control.

The equipment is simple, easy to install, inspect, and maintain.

Parts are so designed and protected against leakage and dirt that dependable performance and long life are assured.

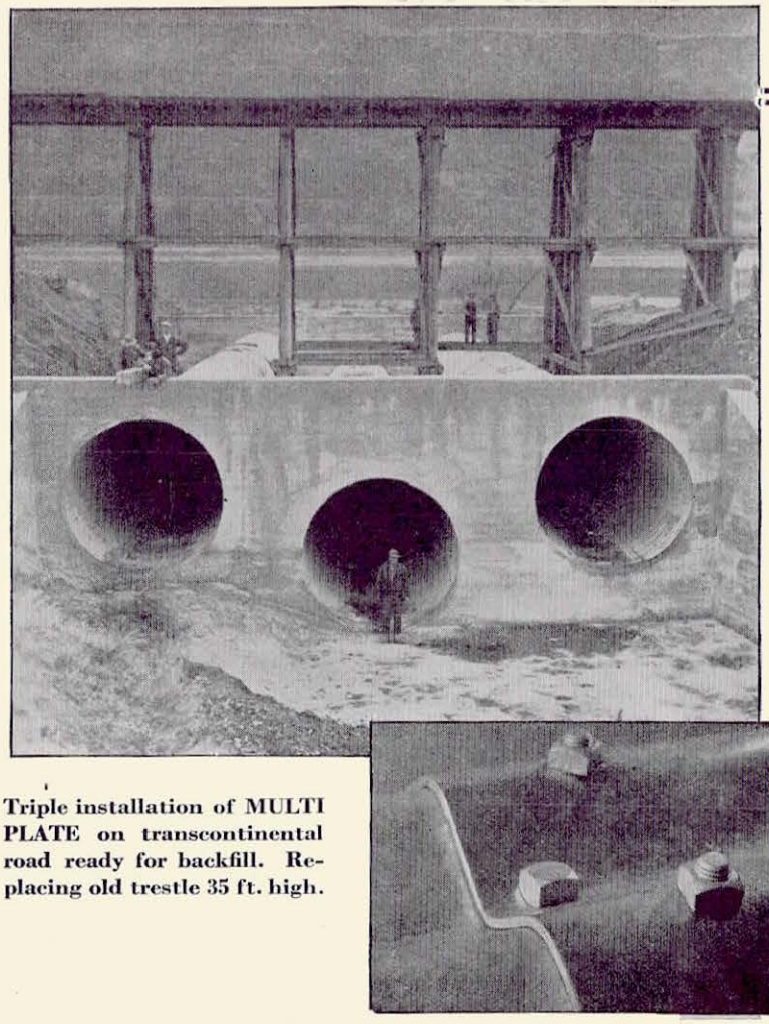
WESTINGHOUSE AIR BRAKE CO.

GENERAL OFFICE AND WORKS:

WILMERDING, « » « » PENNSYLVANIA

ARMCO'S GIANT

Super-Size Super-Strength Super-Service. . . .



Triple installation of MULTI PLATE on transcontinental road ready for backfill. Replacing old trestle 35 ft. high.

Simple bolted construction.

FILLING present day demands for economy, Armco MULTI PLATE has won immediate favor with railroad officials, engineers and maintenance men.

It is the last word in safe large diameter pipe or arches.

Armco MULTI PLATE is a custom-built product in sizes to 10 feet and more in diameter.

Punched, formed to shape, and galvanized in the factory, the Armco Ingot Iron plates used in this pipe come "nested" to the job ready for quick assembly.

Erected, it forms a firmly connected, continuous pipe with qualities of super-strength which meet the strictest requirements.

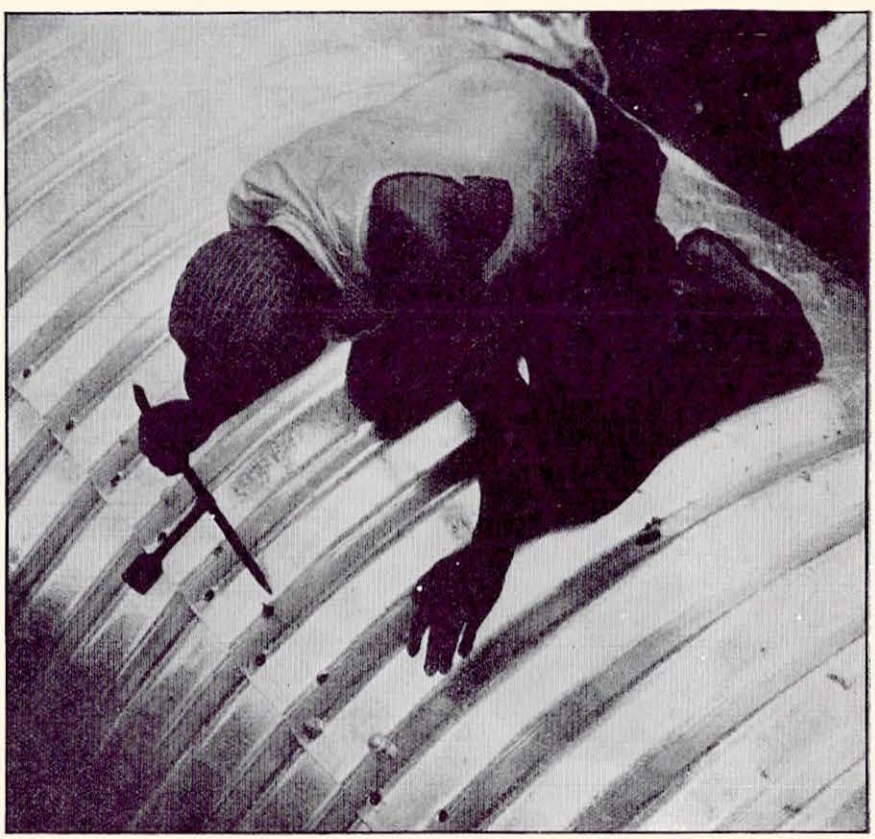
Armco MULTI PLATE is manufactured from the Armco Ingot Iron of The American Rolling Mill Company and always bears its brand.

ARMCO CULVERT MANUFACTURERS ASSN.

HEAVY-DUTY PIPE . .

Here's Why

The GREATER STRENGTH
The GREATER DURABILITY



CORRUGATIONS are more than twice as wide and three times as deep. Armco Ingot Iron plates are four times as thick as standard 16 gage. That's why Armco MULTI PLATE sets new standards for greater strength and durability.

Another advantage is this: where excessive service may be expected in the invert, heavier gages may be used than in the upper circumference. This again illustrates the custom-built features of Armco MULTI PLATE for large culvert jobs, arch relining, trestle replacements, etc. Let us tell you more about it.

Uppermost — Its ECONOMY

Figured against every other practical type of structure, Armco MULTI PLATE actually saves hundreds, often thousands of dollars.

Quick installation, minimum of equipment, and ease of handling contribute to savings never before possible in this size structure.

Get the facts about Armco MULTI PLATE. Mail the coupon today for complete information.

ARMCO MULTI PLATE

MULTI ARMCO PLATE

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Gentlemen: Send me at once facts and complete data on ARMCO MULTI PLATE.

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Road .....

Address .....

City .....

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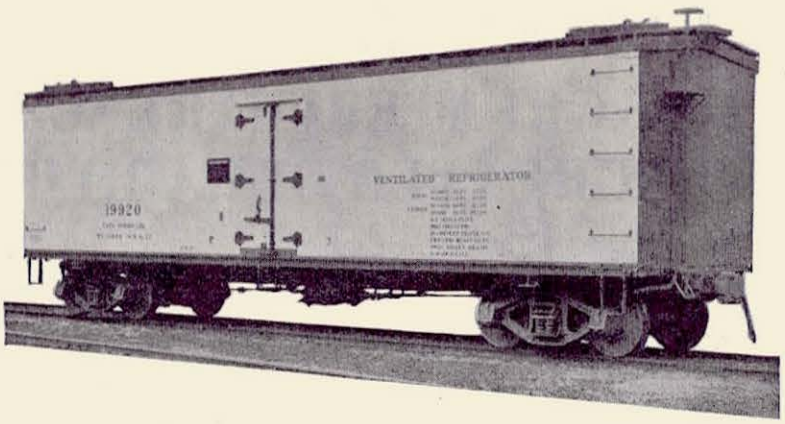
GRIFFIN WHEEL COMPANY

MOST ESSENTIAL TO OUR DAILY EXISTENCE



INDISPENSABLE IN THE MOVEMENT OF FREIGHT CARS

OVER **800,000** FREIGHT CARS INCLUDING REFRIGERATORS EQUIPPED WITH **GRIFFIN** CHILLED TREAD WHEELS.

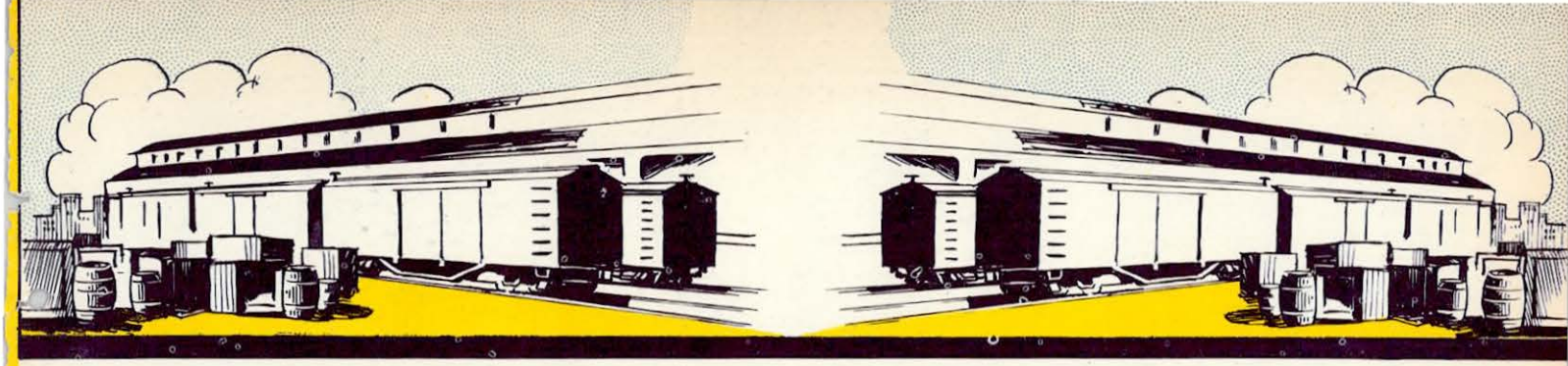
THE FOOD SUPPLY OF THE NATION IS CARRIED ON CHILLED TREAD WHEELS

GRIFFIN WHEEL COMPANY

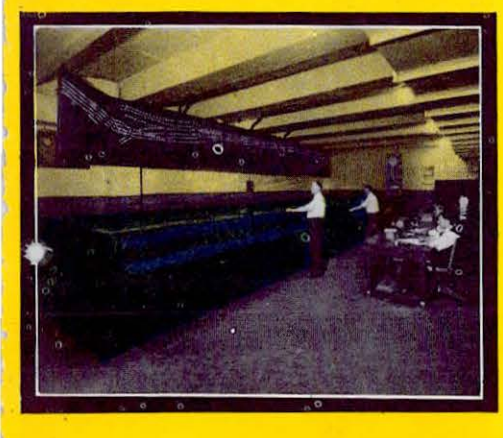
410 NORTH MICHIGAN AVENUE CHICAGO, ILLINOIS

Plants

Chicago	Boston	Cincinnati	Kansas City	Denver	Los Angeles
Detroit	Cleveland	St. Paul	Council Bluffs	Salt Lake City	Tacoma



MORE TON MILES PER TRAIN HOUR

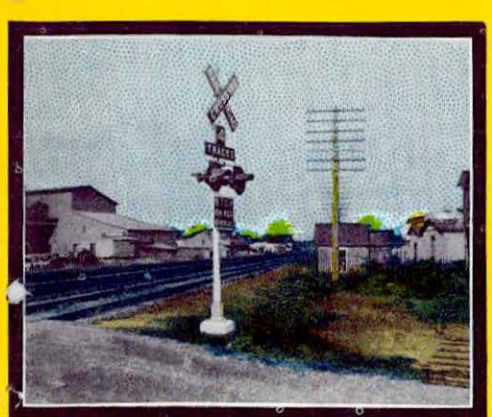


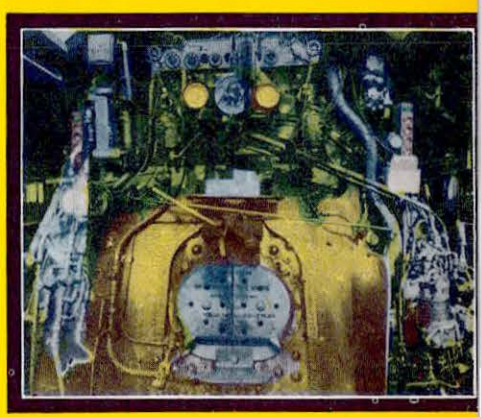
A LOWER cost per ton mile is the insistent demand. Therefore, the expense of producing a ton mile must be reduced.

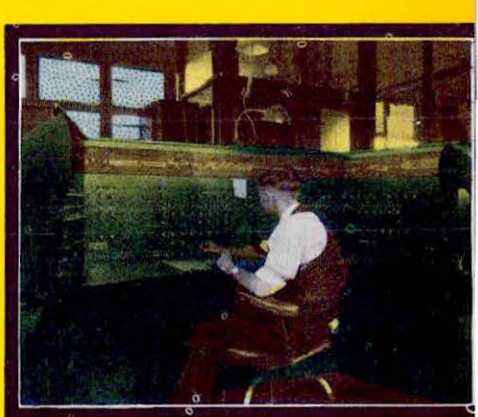
Tonnage fluctuates with business conditions and ordinarily is beyond control of the railroads. Operating expenses, however, are largely subject to control and great strides have been made by the managements in reducing expenses and improving operating efficiency.

Modern signaling has contributed to this program of efficiency and is capable of doing more. In addition to providing more expeditious handling of trains with greater safety, signal installations have reduced transportation costs by eliminating expensive delays.

There are many locations where a small signaling expenditure will yield attractive savings, even with present traffic.



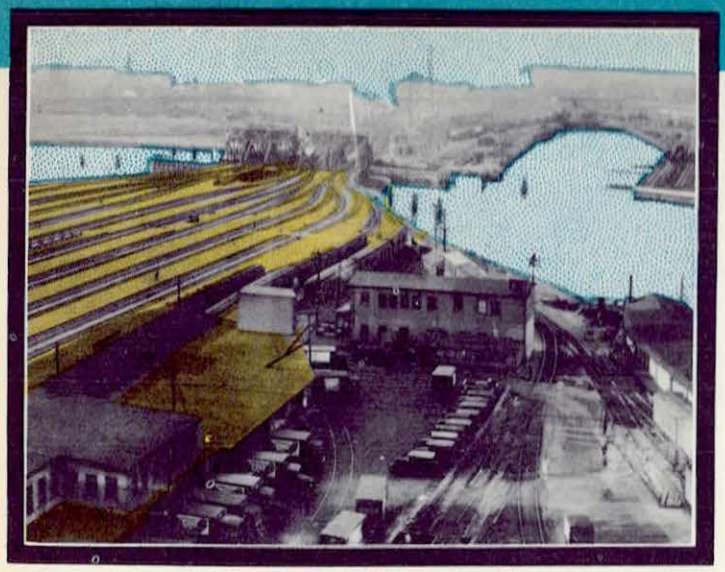




1881 1933

Union Switch & Signal Co.

SWISSVALE, PA.



A LONG LIFE OF ECONOMICAL SERVICE

"UNION" Electro-Pneumatic Interlocking is constantly in demand all over the world . . . wherever there are railroads. Its long life in service, its compactness of design, permitting many functions to be operated from one lever; its simplicity and its sturdy construction make it an important consideration in the economical and efficient functioning of a railroad. Its excellent, long life service and small maintenance cost have been proved. One road has had more than 37 years of satisfactory service; others over 30 years — such records are not unusual. Specify "Union" Electro-Pneumatic Interlocking for your terminals and outlying power plants for long years of satisfactory service.

A 39 PER CENT RETURN ON INVESTMENT IN C. T. C.

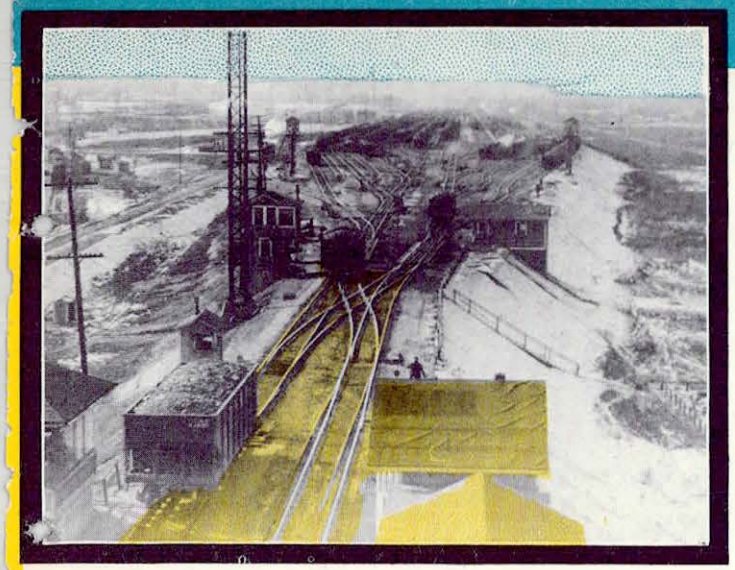
IT IS NOT necessary to equip a whole division with "Union" Centralized Traffic Control to reduce operating expenses. Many installations have been made at locations where a small investment is yielding large returns. For example, on one road C. T. C. solved the "bottleneck" problem at a tunnel location and effected a saving of 39 per cent on the investment, exclusive of train hours saved.

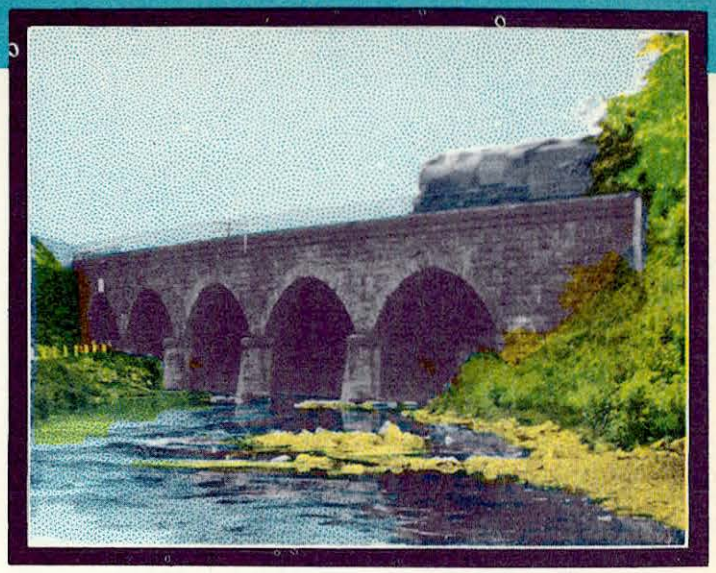
With equal success, "Union" C. T. C. has been installed to provide protection for gauntlets, passing sidings, crossovers, ends of multiple tracks, junctions, yard entrances and exits, highway grade crossings and terminals. "Union" C. T. C. begins paying dividends at once.

1881 1933

DISTRICT OFFICES

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO





A 40 PER CENT RETURN ON INVESTMENT IN CAR RETARDERS

AN installation of "Union" Electro-Pneumatic Car Retarders in a classification yard used exclusively for loaded coal cars, reduced the yard costs 25 cents per car, equivalent to 40 per cent on the investment, above interest and depreciation. Retarders make available the entire yard capacity at any time and pay for themselves in from one to three years. "Union" Electro-Pneumatic Retarders maintain a smooth and continuous movement of cars through a terminal or yard; speed shipments; reduce accidents and facilitate yard operation. East, West, North, South—from all parts of the country—figures are obtainable showing the large savings effected by the installation of this modern car retarder.

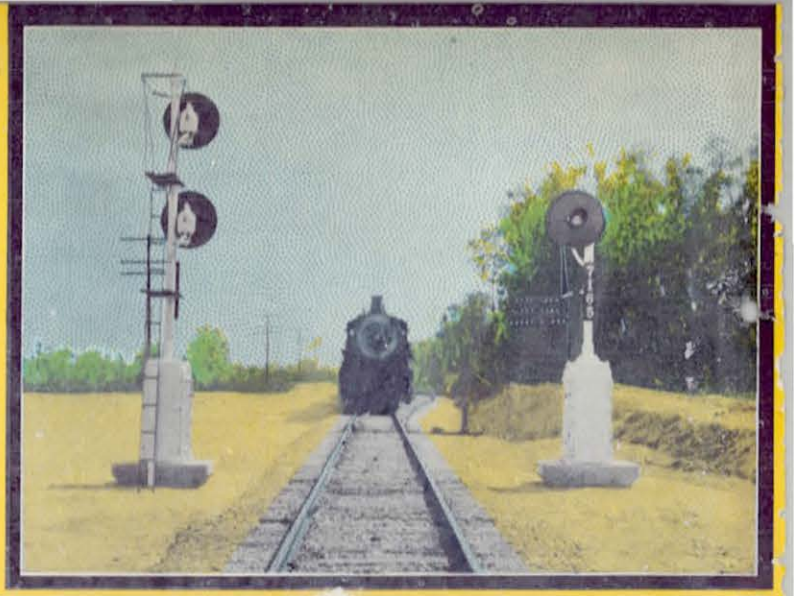
INCREASED SAFETY WITH CAB SIGNALS

"UNION" Cab Signals, constantly visible, give the engineman a *continuous* indication of conditions ahead. Information of changed track conditions, whether more or less restrictive, comes to the engineman and fireman at the instant the changes occur, regardless of the position of the train in the block.

Weather conditions, such as fog, smoke, sleet and storm, need no longer be obstacles in maintaining schedules so far as the visibility of signals is concerned after installing the "Union" Cab Signal System. Cab Signals assist in providing uninterrupted service, in increasing the safety of operation and enabling users to produce more ton miles per train hour at less cost.

Union Switch & Signal Co.
SWISSVALE, PA.

1881 1933



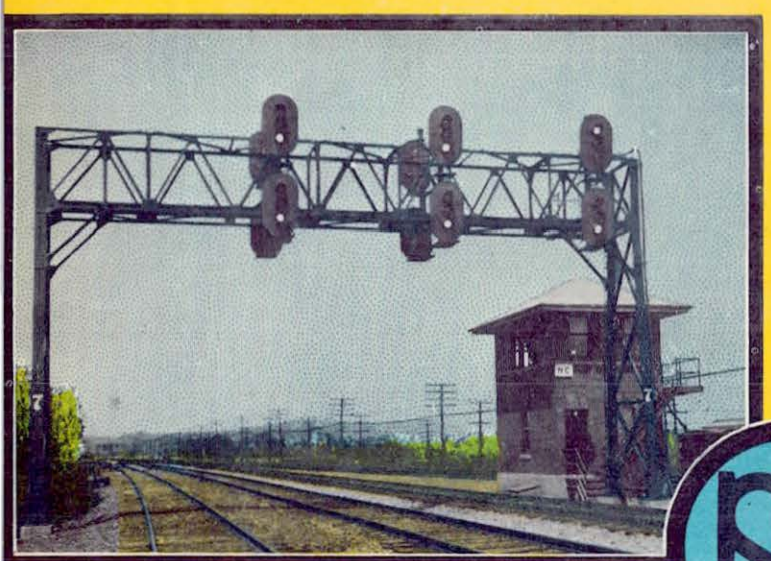
40 PER CENT SAVED ON THE INVESTMENT ANNUALLY

One railway installed "Union" Flashing Light Highway Crossing Signals at 13 crossings. Flagmen and gates were replaced at 9 crossings; flagmen at 2 crossings, while protection was given 2 crossings not previously protected. Twenty-four hour protection is maintained with the new signals in place of 12 hours previously. Saving in direct operating expenses alone was 40 per cent on the investment.

Aside from savings effected by replacing other types of protection (these savings ranging from 15 per cent to more than 100 per cent on the investment), the "Union" HC-8 Flashing Light Highway Crossing Signal is instrumental in decreasing crossing accidents. It is cheaper to provide protection than to pay accident claims, likewise it is economy to buy *proved protection*.

Taking advantage of the many opportunities for small savings which can be made through constructive signal applications is a step toward retaining operating ratios at a reasonable figure under present conditions.

"Union" representatives will always gladly assist with signaling problems and advise how specific installations can reduce operating costs.



Union Switch & Signal Co.

SWISSVALE, PA.

Where Reading Pipe Serves BEST

No Other Pipe Is "*Just As Good*"

THERE may be parts of your pipe system where the longer life of Reading Puddled Iron Pipe is not needed, or where conditions of use are mild enough to justify less enduring pipe.

But where Reading Pipe can lower pipe costs and eliminate expensive repairs and replacements, *no other kind of pipe is just as good as Reading.*

Through four long generations of actual service, in hundreds of thousands of installations, Reading Puddled Iron Pipe has proved that it is the best kind of pipe for *certain specific conditions of use,* such as those shown on this page. Where those conditions are present, it is false economy to use an inferior material. Insist on Reading Puddled Iron Pipe for those installations in which it stands without an equal.

For Vents

When exposed to atmospheric corrosion, Reading Puddled Iron Pipe forms *two* hard, impervious films of oxide which effectively prevent destructive pitting and penetration of rust. Corrosion is actually *stifled.*

For Underground Service Connections

In acid or alkaline soils, Galvanized Extra Heavy Reading Puddled Iron Pipe pays for itself many times over in freedom from repair and replacement costs. Under electrolytic action—the destroyer of all metals—Reading Pipe is the *least* affected.

For Steam Return Lines

The severe corrosive conditions present in steam return lines call for Extra Strong Reading Puddled Iron Pipe. Reading Puddled Iron is a physical compound of practically pure iron base metal, containing hundreds of thousands of filaments of protective silicate. This unique composition gives *double* protection from rust.

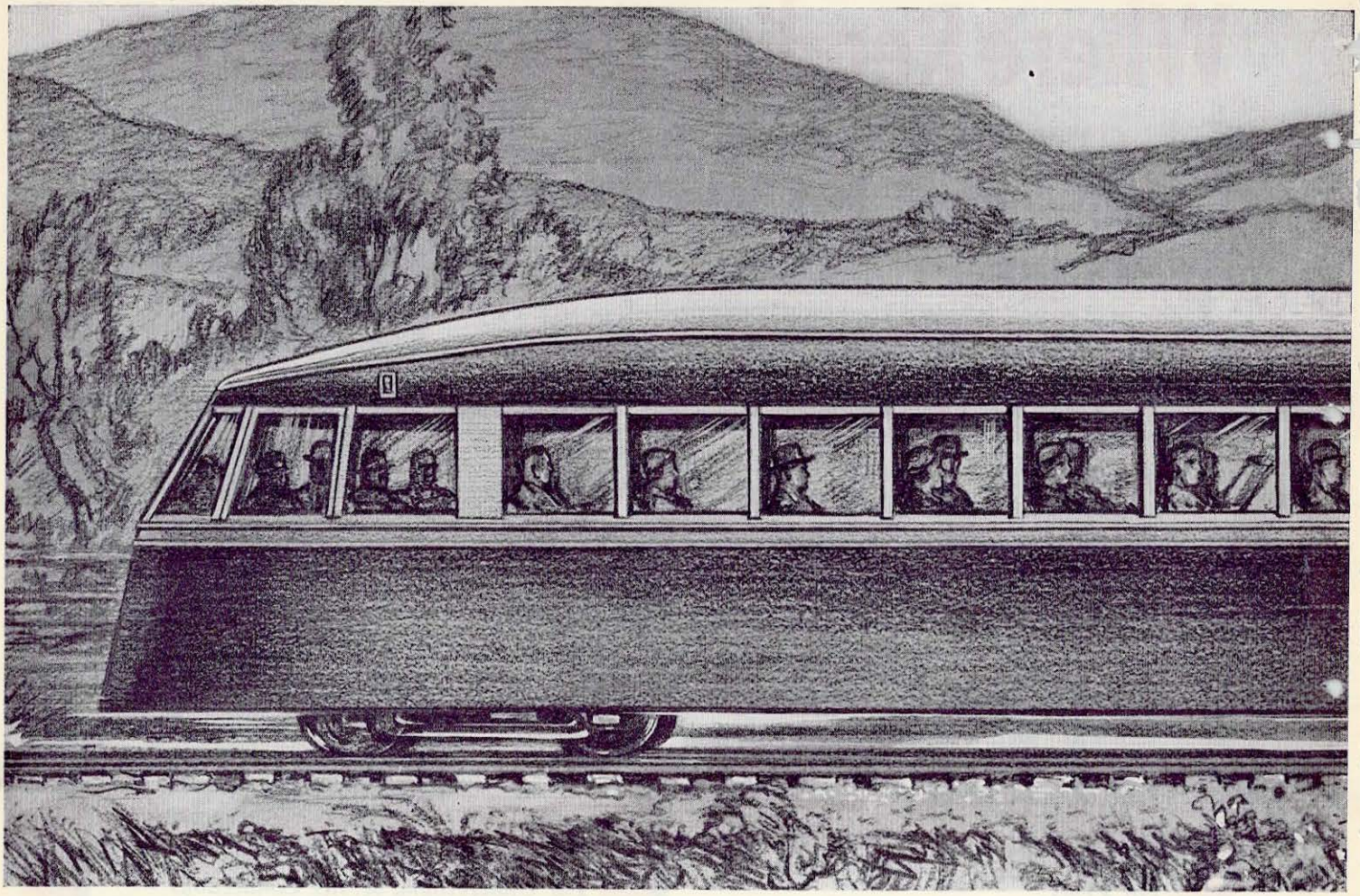
For Drains

Alternating wet and dry conditions often mean swift death for most kinds of pipe. Reading Galvanized Standard Puddled Iron Pipe is especially adapted to give long service under such conditions. For underground drains, Reading Galvanized Extra Heavy Puddled Iron Pipe is recommended.

READING
PUDDLED IRON
SINCE 1848

READING IRON COMPANY
PHILADELPHIA

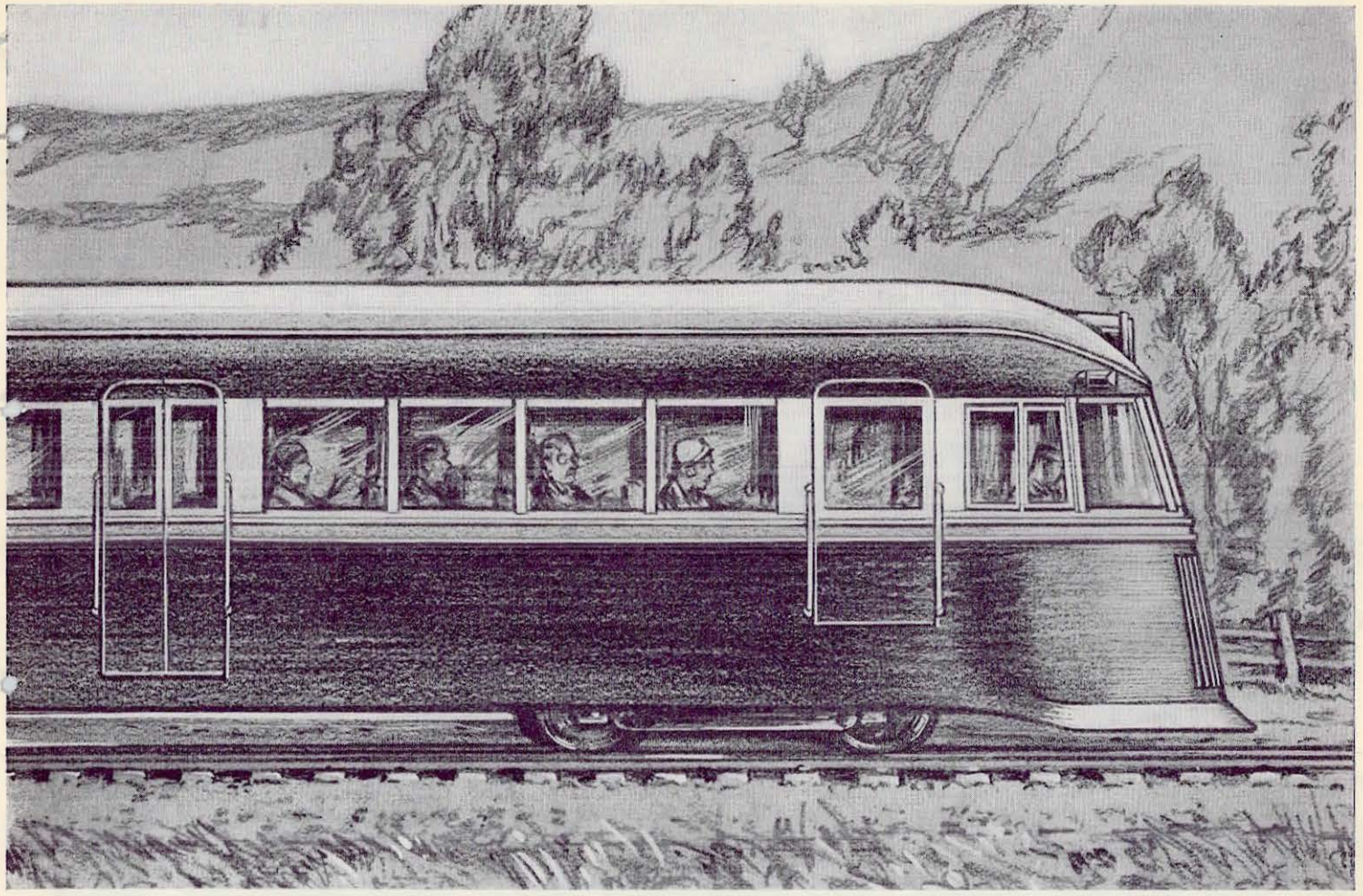
Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Iron



MODEL 60 HIGH-SPEED

THE NEW MEMBER OF THE BRILL RAIL CAR FAMILY

Light-weight
Solid construction
Seats 52 passengers
Single car operation
Speed—70 miles per hr.



STREAMLINE RAIL MOTOR CAR

THIS high-speed ultra-modern streamline Brill Model 60 represents the latest achievement in rail motor car design. Especially adapted to frequent high-speed low cost service.

All materials, craftsmanship and appurtenances are of the highest character and conform to the best car-building practices.

For years The J. G. Brill Company has led the way in rail motor car construction having designed and built about 50 per cent of all the rail motor cars sold in this country since 1924.

A Brill Rail Motor Car For Every Purpose makes Brill Service complete. Other members of the Brill family are:

Model 860 — 550 HP
Model 660 — 415 HP
Model 350 — 300 HP
Model 70 — 175 HP
Model 55 — 90 HP

Brill Rail Motor Cars will step up your passenger patronage and reduce operating costs. You should have complete information covering these epoch-making rail motor cars.

THE J. G. BRILL COMPANY

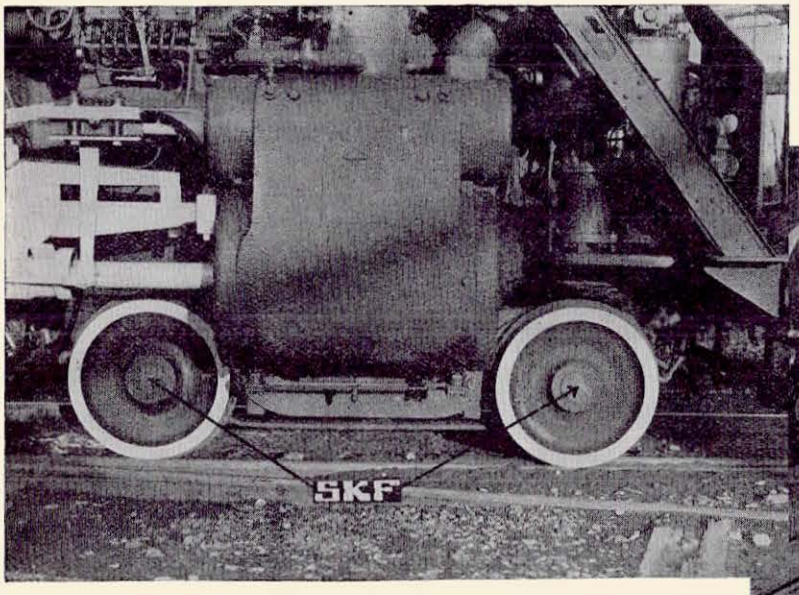
PHILADELPHIA · CHICAGO · NEW YORK · SAN FRANCISCO

BRILL

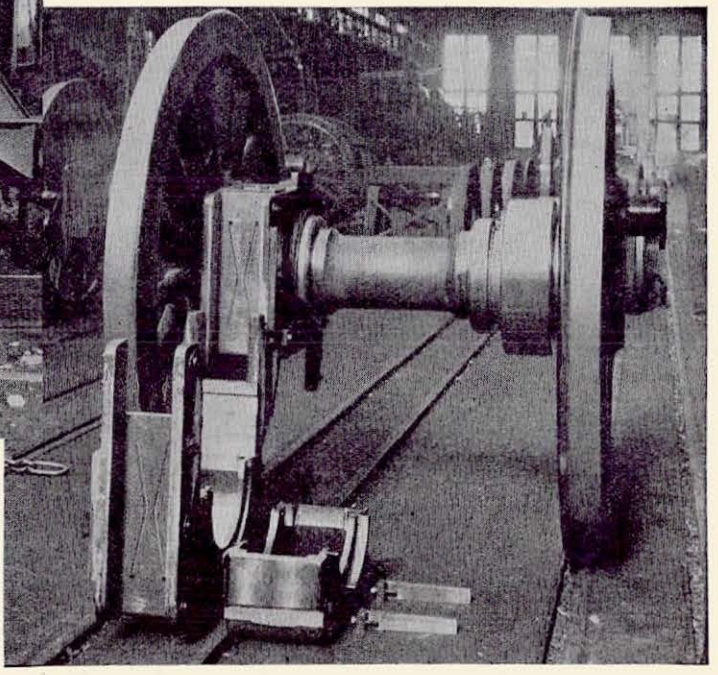
THE HIGHLIGHTS OF 1932 . . .

SKF "MARCHES

New Achievements



TRUCKS: No hub liners required with SKF's



DRIVERS: Another milestone in SKF development

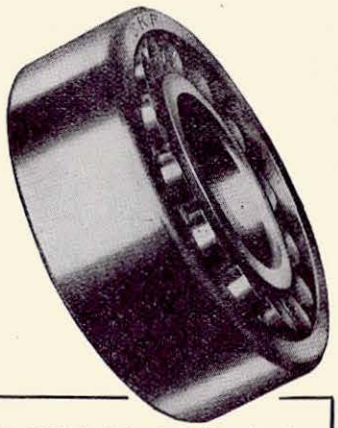
1932 Marks 16 Years of SKF Railroad Pioneering

• PROGRESS . . . in spite of adverse conditions . . . improvements carried on with a never-faltering faith in the future . . . this has been SKF's contribution to the railroad industry in 1932 . . . SKF "Marches On!"

SKF Journal Bearings in service at the turn of the year have rolled up additional records of unfailing performance on the railroads of America and the world. They have now gone over 1,100,000 miles under railroad coaches . . . over 400,000 miles on engine trucks...and tenders...over 160,000 miles on drivers. Such consistency again emphasizes the many proven advantages of these bearings under hard and exacting conditions that have a very direct and important influence on continuity of schedules and low cost operation.

In general, the outstanding characteristics of SKF Journal Bearings that promote the highest efficiency of railroad equipment include . . . the reduction of friction to a minimum insuring smooth starting with conservation of power; ample ruggedness and stamina that insures a long bearing life at the lowest cost per mile; low maintenance as the bearings require only infrequent inspection and lubrication . . . *and no adjustments.*

Specifically, SKF Journal Bearings have advantages which are especially valuable on certain railroad applications. On leading engine trucks, they maintain a constant lateral movement and insure savings by the elimination of liners, hub wear and other factors which affect friction bearings. The success of SKF Bearings on driving axles marks another milestone in anti-fric-

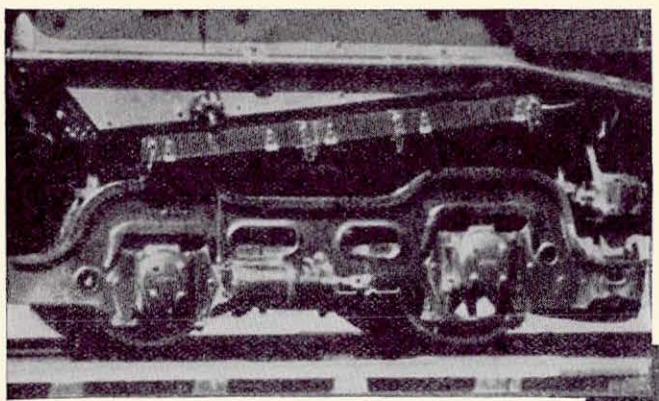


The SKF Spherical Bearing is self-aligning and self-contained. Two rows of rollers and equal load distribution provide the maximum bearing capacity in a given space. No hub liners are required. All lateral thrust is carried in the bearing.

ON!"...

Replacing Old Ones

tion development. Here is an application that demands the utmost in brute strength, reliability and long life to insure uninterrupted service of locomotives . . . and SKF's met this crucial test of actual railroad service with complete success. And the same holds true of SKF's on tenders and trailers . . . for SKF's are easily accessible . . . insure freedom from hot boxes and expensive detentions.



TRAILERS: SKF Bearings easily accessible

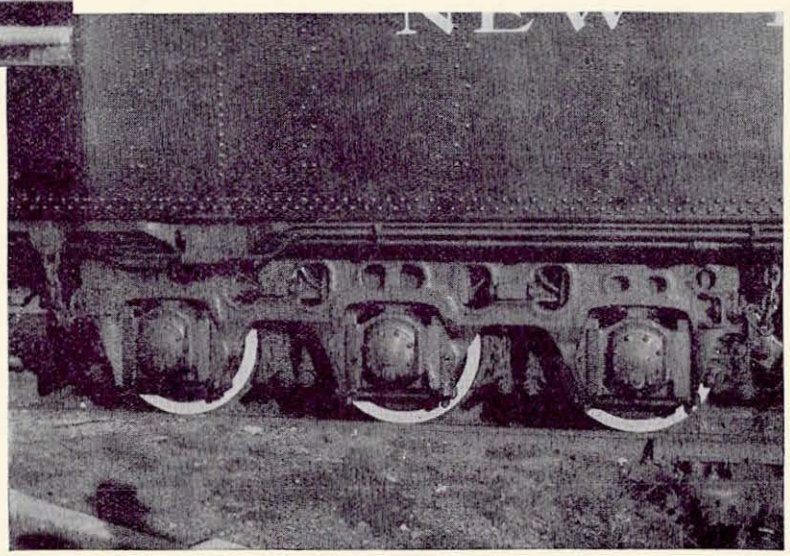
SKF accomplishments at the close of 1932 mark important advances toward the complete anti-frictionizing of railroad equipment completing sixteen years of pioneering development, experience and applications *to coaches and locomotives owned and operated by railroads.*

SKF Bearings are specified, bought and preferred on the basis of *proved performance* . . . the type of performance that has convinced American railroads that it is *service,* not the first cost of a bearing that determines real bearing economy. And SKF pioneering will continue in the future to promote higher mechanical efficiency, greater dependability and lower maintenance . . . for that is the solid foundation on which SKF Leadership has become so firmly established in the railroad field . . . and why more SKF Bearings are used on the railroads of the world than all other anti-friction bearings combined . . . SKF "Marches On!"

SKF INDUSTRIES, INC., 40 East 34th St., New York

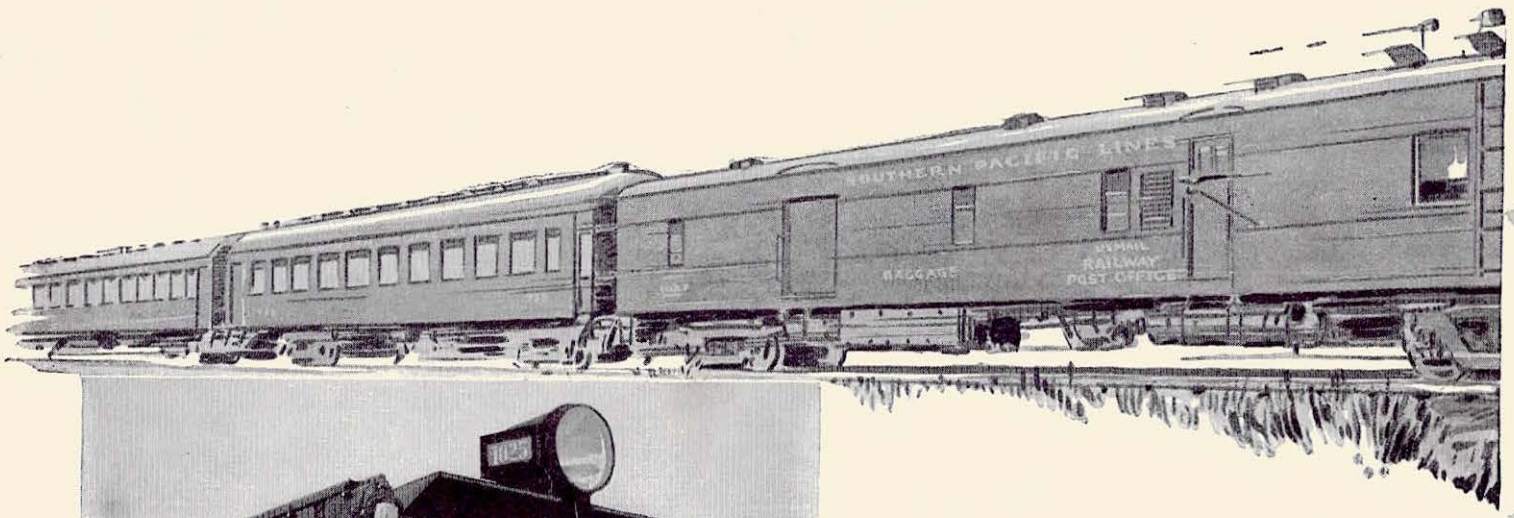
2986

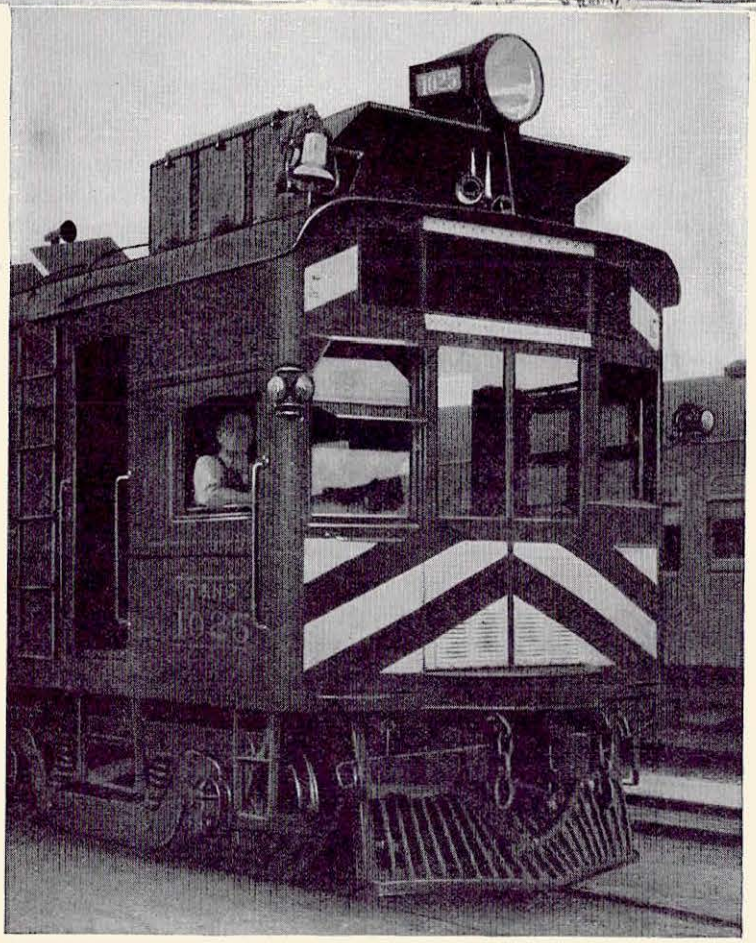
SKF
JOURNAL BEARINGS



TENDERS: SKF's have ample capacity for this job

AT A FRACTION OF





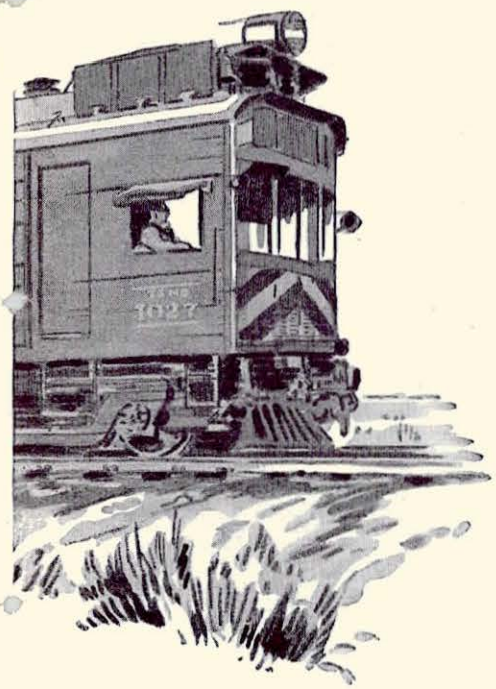
One of the 400-hp. gas-electric rail motor cars of the Southern Pacific Lines in Texas and Louisiana, equipped with G-E generators, motors, control, and air compressors

RAIL MOTOR cars, electrically equipped, are proving their value by furnishing adequate, dependable service at a cost far below that of steam-train operation. Their economies, made both on branch lines and on light-traffic main-line schedules, have been reported as high as 50 per cent, compared with steam-train operating costs.

The advantages of rail motor cars lie principally in their high availability, the use of low-cost fuel, and the elimination of facilities necessary for servicing steam locomotives. This is of vital importance to the railroads because of the reduction in traffic due to competing forms of transportation. There are in service cars ranging in capacity from 150 to 900 hp., convenient units of motive power, adaptable to a wide variety of operating conditions.

GENERAL

STEAM-TRAIN COST



Electrically equipped rail motor cars give efficient, reliable service

THE experience of the Southern Pacific Lines in Texas and Louisiana, in operating gas-electric cars, offers definite proof of motor-car economy. In 1929 and 1930, twelve cars, eight of which were equipped by General Electric, were substituted for steam service. The following is a brief summary of operating results:

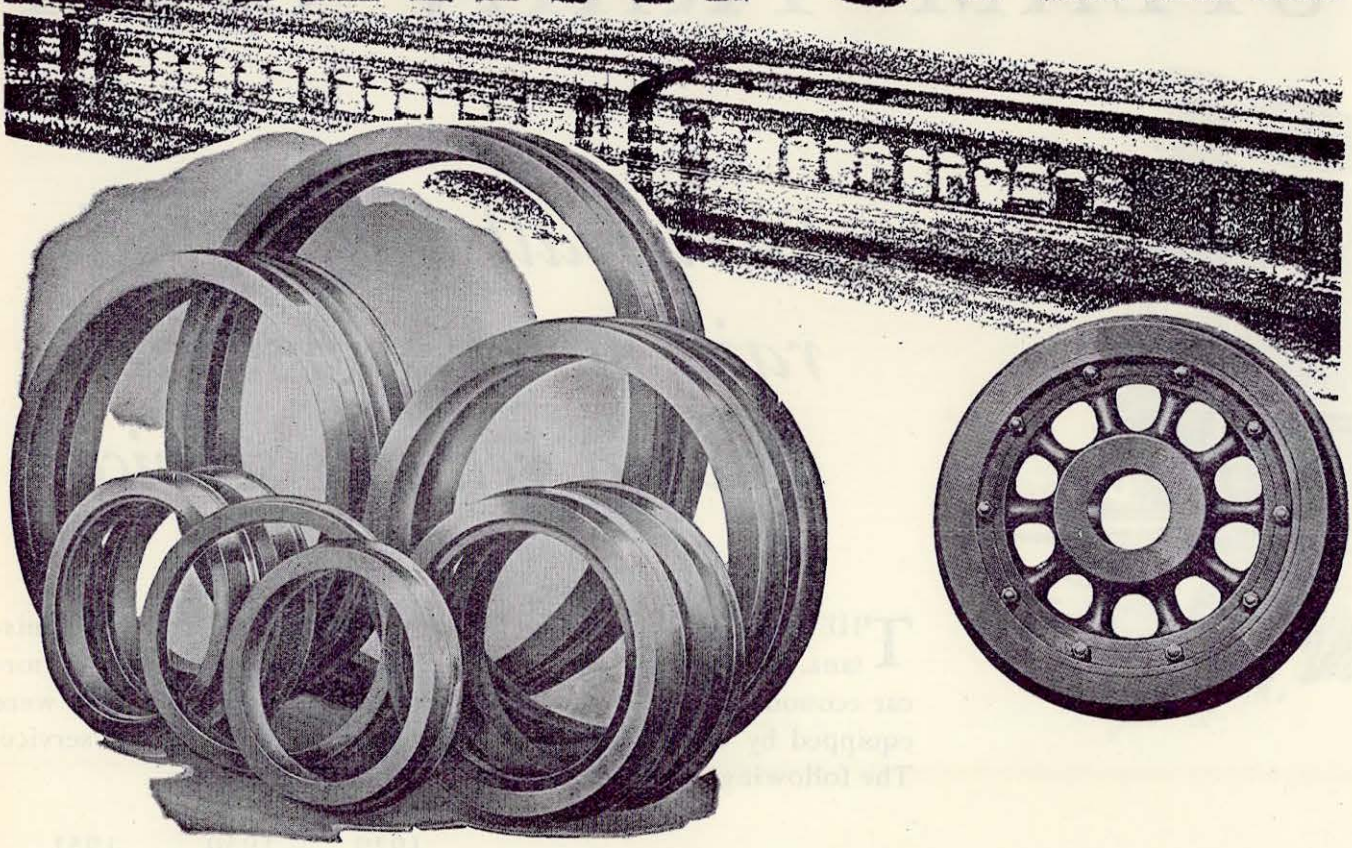
	1929	1930	1931
Number of Gas-electric Rail Motor Cars	4	12	12
Total Motor Train Mileage	234,370	989,498	1,060,742
Availability	92.1%	95.3%	96.2%
Total Cost of Operation Per Motor-Train-Mile, Including Maintenance, 6% Interest and 6% Depreciation	$0.3705	$0.3896	$0.3719
Annual Saving Over Comparable Steam-Train Service	$77,225	$307,140	$348,029
Net Return on Investment	39.4%	48.7%	55.2%

General Electric rail-motor-car equipment, in service on 41 American railroads, has proved its dependability. It is an investment that will pay large dividends for many years to come. General Electric Company, Schenectady, New York.

391-52

ELECTRIC

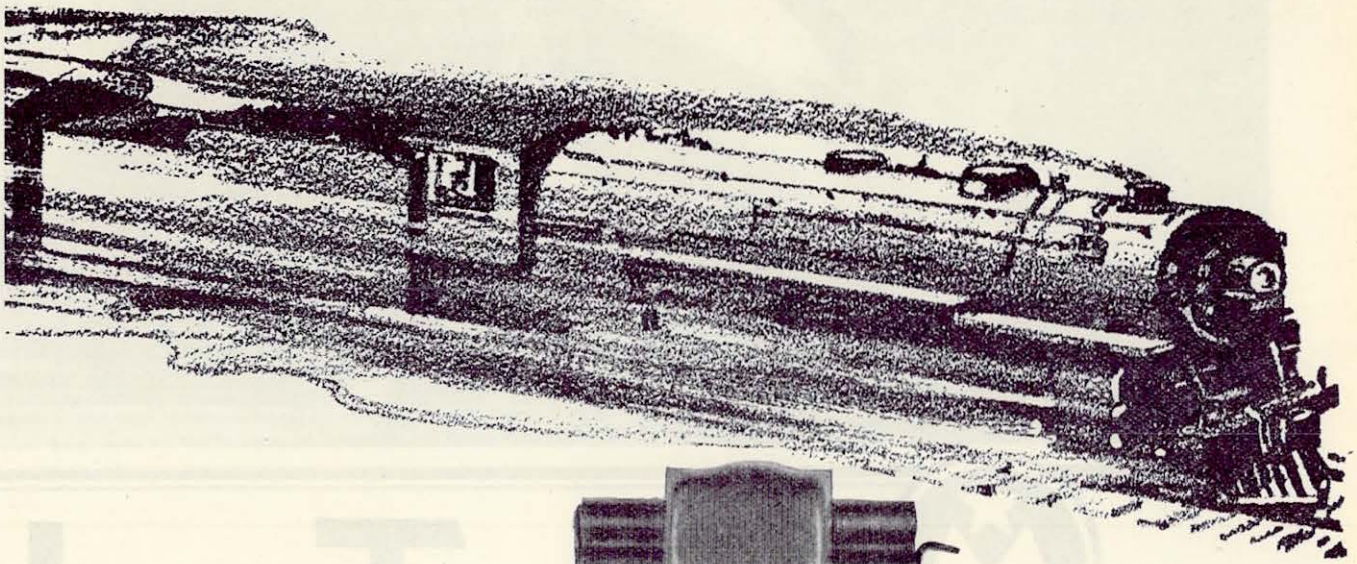
RAILWAY STEEL

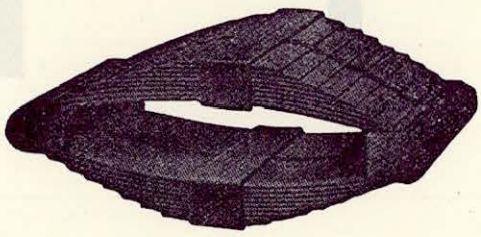


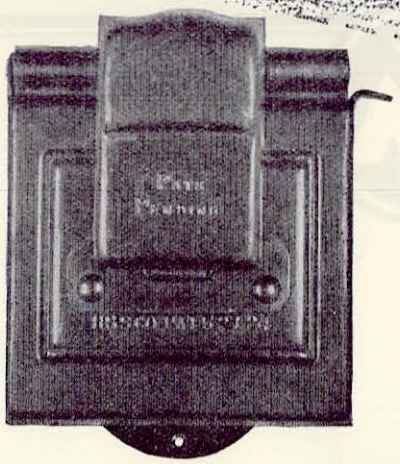
The name of Railway Steel-Spring Company has for many years been associated with the manufacture of Steel Springs, Locomotive and Car-wheel Tires, Steel-tired Wheels, Pressed Steel Journal Box Lids and kindred products for railroad equipment and industrial purposes. Its reputation has been built upon the strong founda-

"RAILWAY"

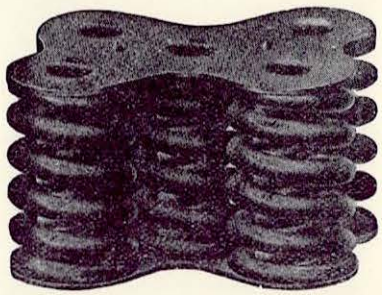
SPRING COMPANY

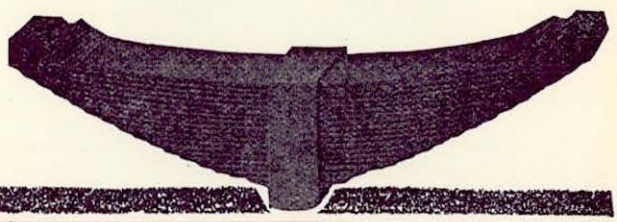






tion of achievement and service in this field. It stands today pre-eminent, and is acknowledged as the foremost manufacturer of these specialties.



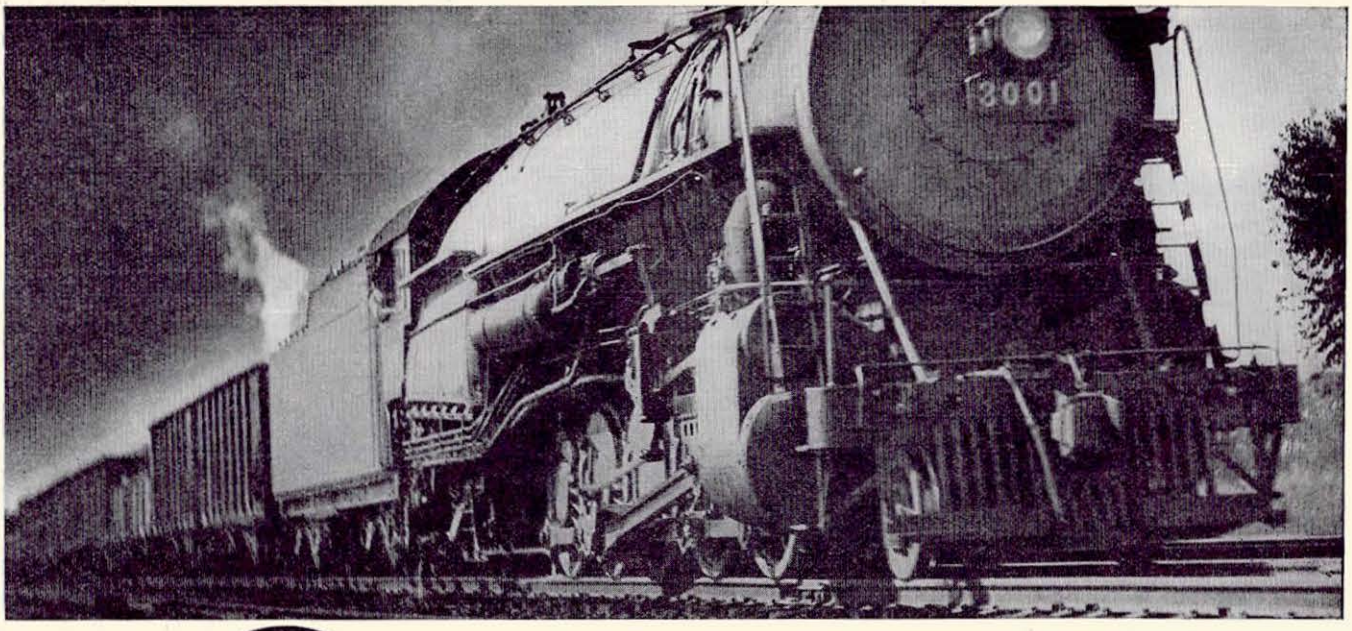


Railway Steel-Spring Company

30 CHURCH ST., NEW YORK

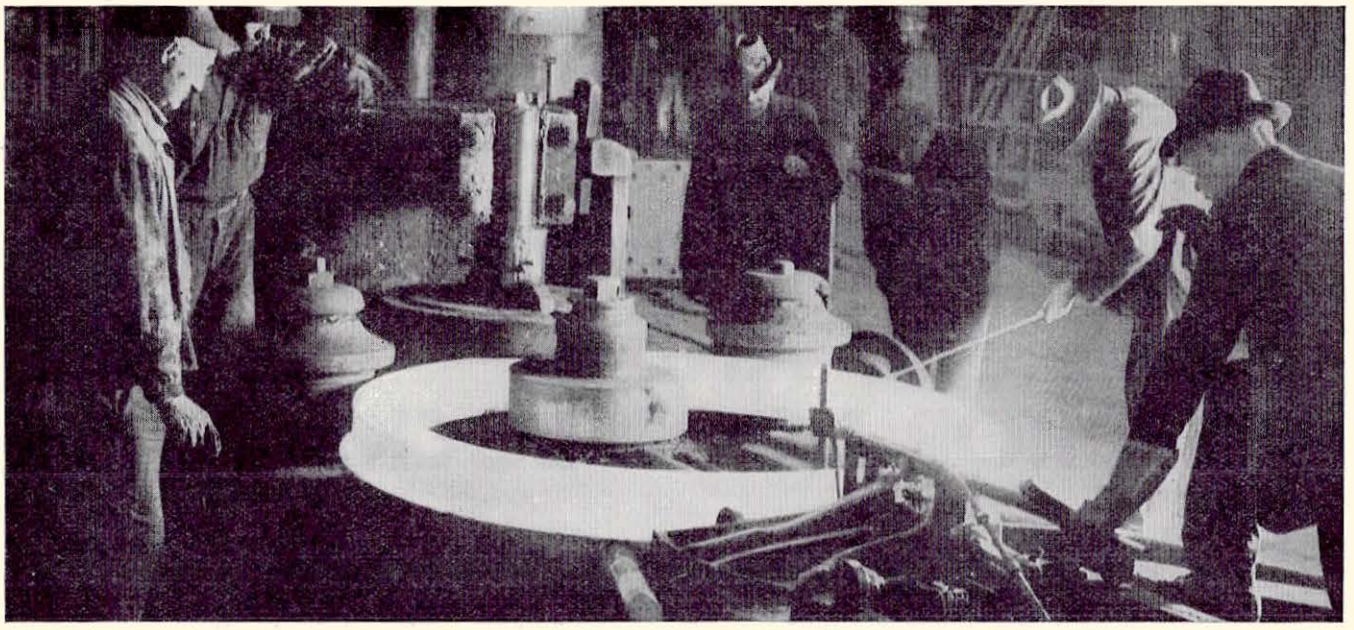
Branch Offices:

Chicago, Ill. Washington, D. C. Cleveland, Ohio Pittsburgh, Pa. Montreal, Que.
St. Paul, Minn. St. Louis, Mo. Denver, Colo. San Francisco, Cal.



T I

by M I D



R E S

The driving tires of the nation's fastest train—the locomotive wheels in the nation's largest coal and metal mines—standing up under spectacular speed or hauling phenomenal loads—are Midvale tires. Extra months and years of wear, yet at the same time standing the burden of heavy duty—there must be a reason for Midvale service.

The answer is simple. Midvale tires are made from super steel, actually tool steel. And Midvale tires are made in shops where, whatever the job, the men are required to maintain what they proudly call "Midvale quality."

When you buy a tire you are not buying so many pounds of steel. You are buying so many years of service. On that basis you cannot purchase more economical tires than those by Midvale.

THE MIDVALE COMPANY • NICETOWN, PHILADELPHIA

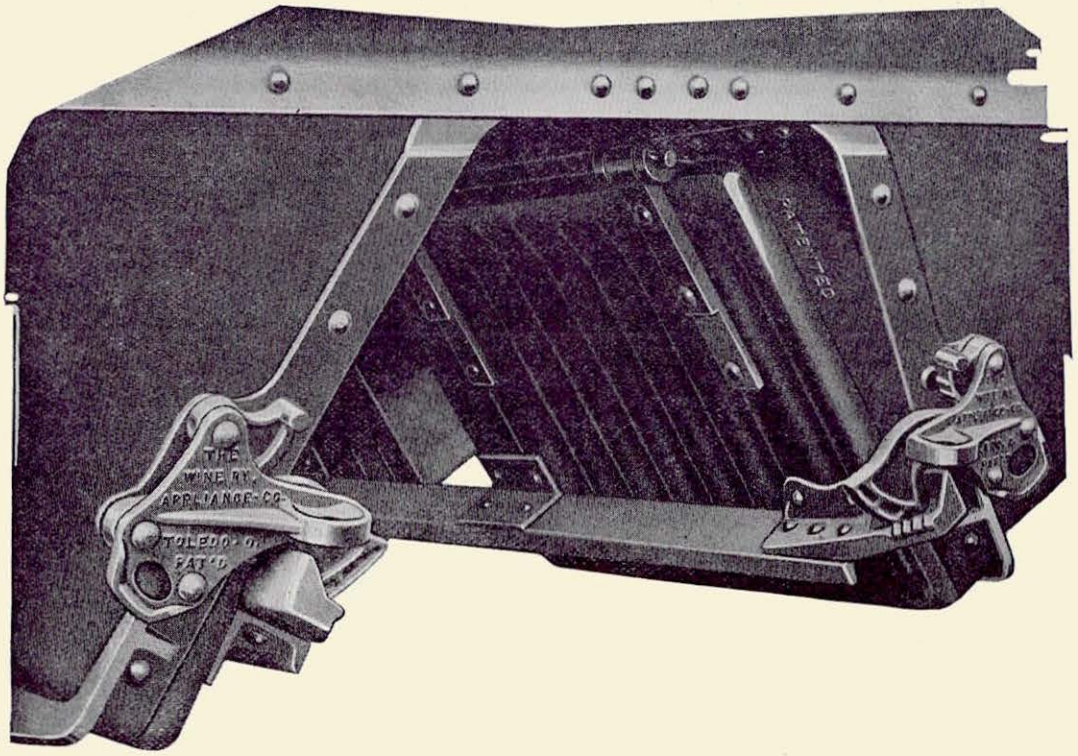
District Offices:

New York Pittsburgh Washington Cleveland Chicago San Francisco

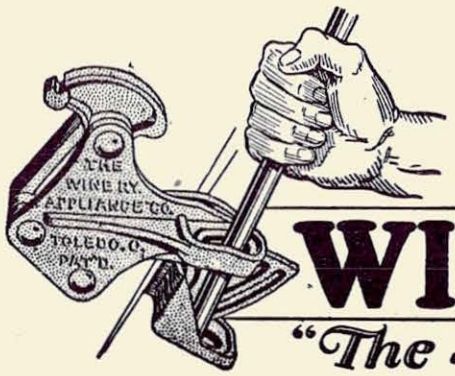
V A L E

LEAK PROOF.

WINE HOPPER FRAMES AND DROP DOOR LOCKS



PROVIDE A PERMANENT AND UNIFORMLY SEALED DOOR FIT.



The Wine Railway Appliance Co.
TOLEDO, OHIO

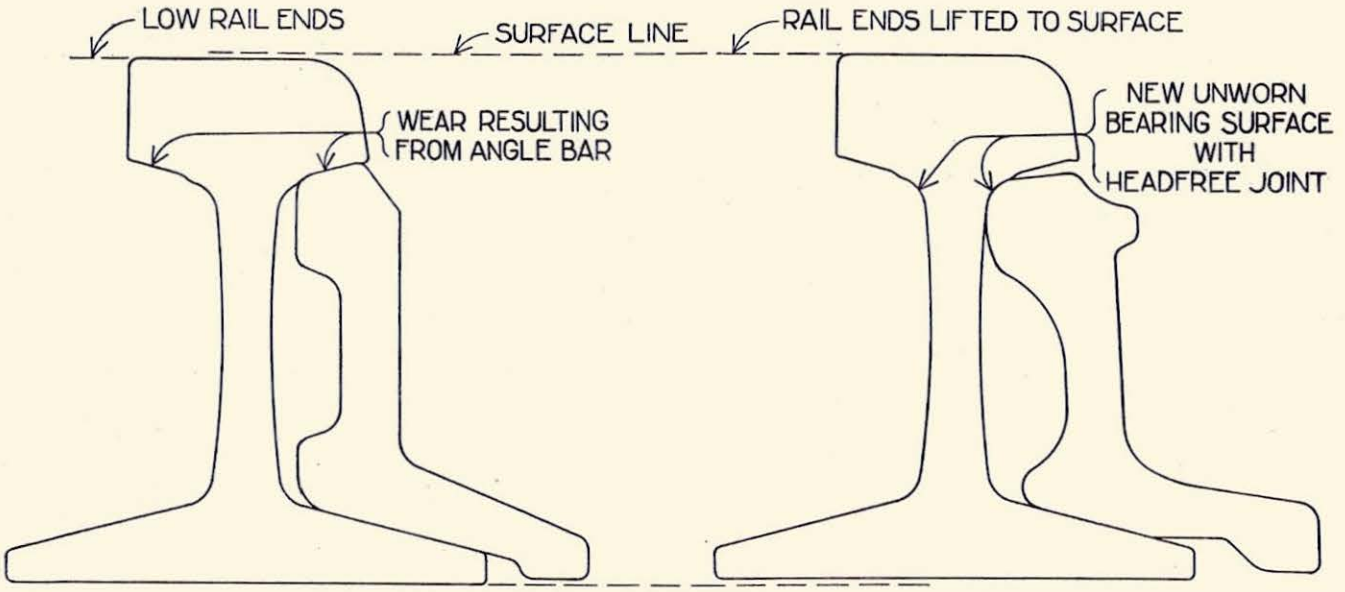
Peoples Gas Bldg.
Chicago

Munsey Bldg.
Washington, D. C.

WINE DOOR LOCKS

"The Simplest of All Door Mechanisms"

ECONOMY
IN TRACK MAINTENANCE


LOW RAIL ENDS
SURFACE LINE
RAIL ENDS LIFTED TO SURFACE
WEAR RESULTING FROM ANGLE BAR
NEW UNWORN BEARING SURFACE WITH HEADFREE JOINT

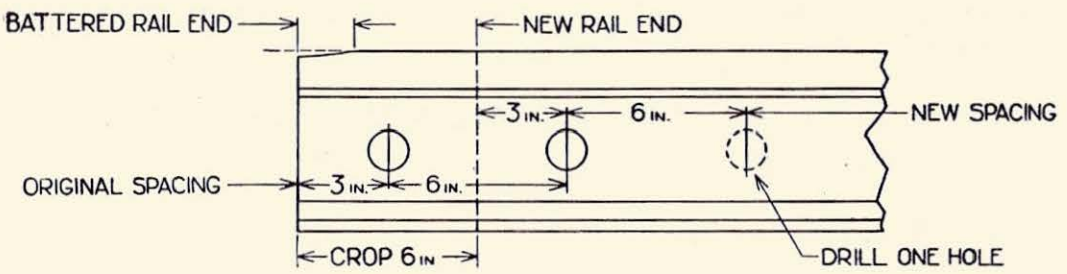
HEADFREE JOINTS

LESS BUILDING UP

PROLONG LIFE

REDUCED CROPPING

FOR WORN RAILS



THE RAIL JOINT COMPANY

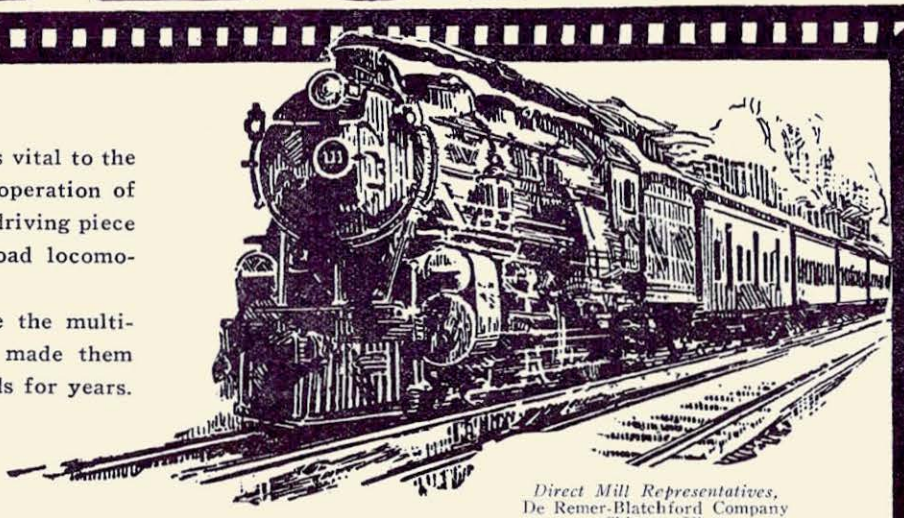
165 Broadway **New York**

Where the strain is greatest . . specify

VULCAN

Vulcan wrought iron is vital to the continuous and efficient operation of that hard working, hard driving piece of machinery—the railroad locomotive.

Vulcan Staybolts have the multiplied strength that has made them favored by many railroads for years.



Direct Mill Representatives,
De Remer-Blatchford Company
Chicago, Ill.

No other part of a locomotive is subjected to more destructive forces than the staybolts—no other kind of metal is more capable of withstanding the terrific strain than VULCAN BLOOM STAYBOLT IRON.

Expansion under high temperatures, sudden contraction under cold weather and cold water, and violent vibration — all are effectively resisted with VULCAN BLOOM STAYBOLT IRON.

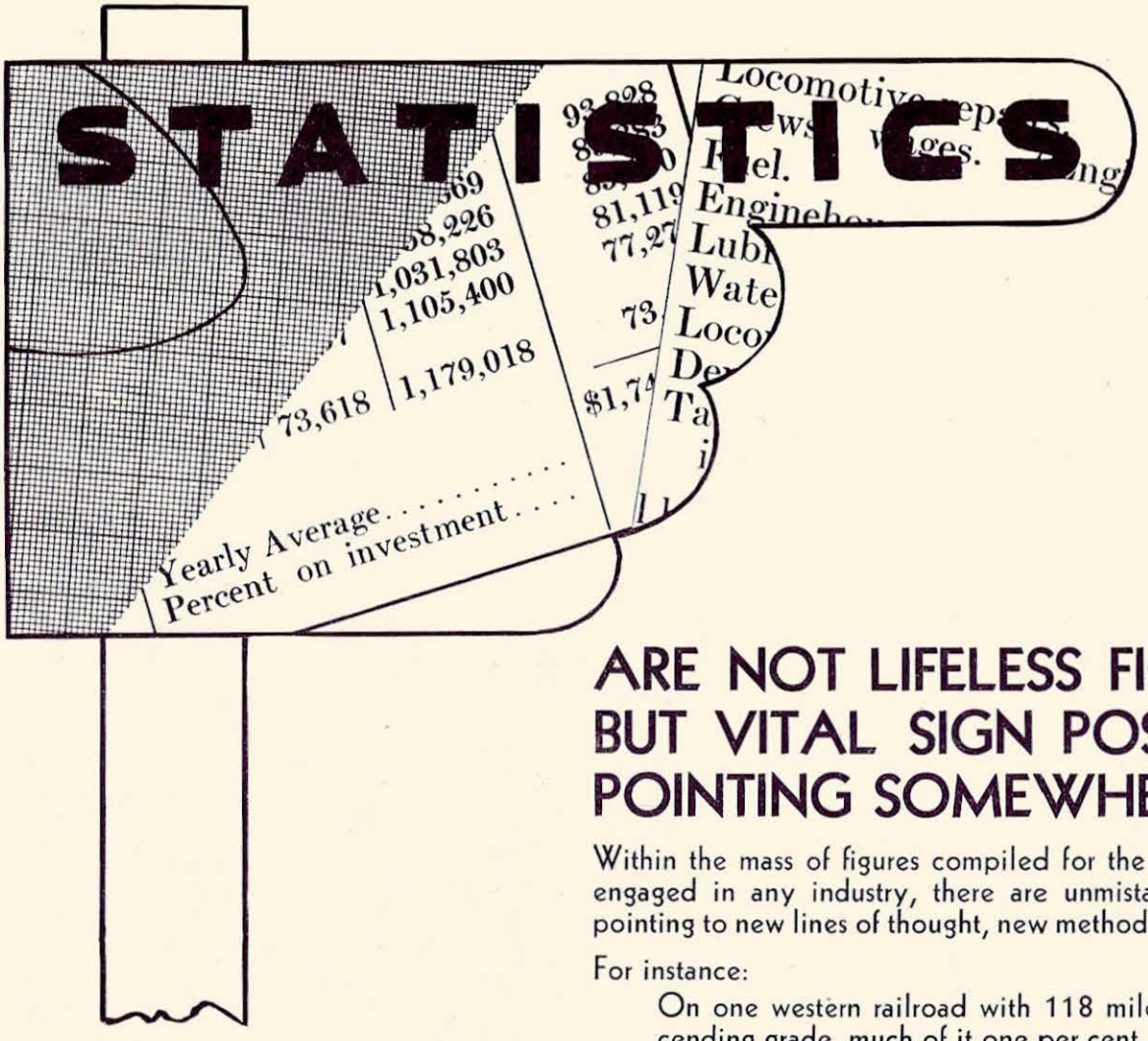
For VULCAN IRON has the built up strength no other metal possesses. It does not have the brittle crystalline structure of *poured* metals—it is made of layer on layer of forged iron welded into a solid homogeneous unit from which VULCAN IRON FORGING BILLETS, VULCAN XX ENGINE BOLT IRON and VULCAN BLOOM STAYBOLT IRON are made.

LOCKHART IRON AND STEEL COMPANY
Pittsburgh Penna.

Direct Mill Representatives
BLATCHFORD CORPORATION
Railway Exchange, Chicago, Ill.

LOCKHART

PITTSBURGH



ARE NOT LIFELESS FIGURES BUT VITAL SIGN POSTS POINTING SOMEWHERE

Within the mass of figures compiled for the use of those engaged in any industry, there are unmistakable trends pointing to new lines of thought, new methods of action.

For instance:

On one western railroad with 118 miles of ascending grade, much of it one per cent, trains of 3100 tons were formerly handled by 2-6-6-2 Mallet locomotives with a helper. Single-expansion 2-8-8-2 type locomotives made it possible to handle trains of 3400 to 3500 tons without the helper. Fuel consumption was reduced from an average of 16.28 to 14.01 gallons of oil per 1000 gross ton miles. Two water stops were eliminated and schedules improved.

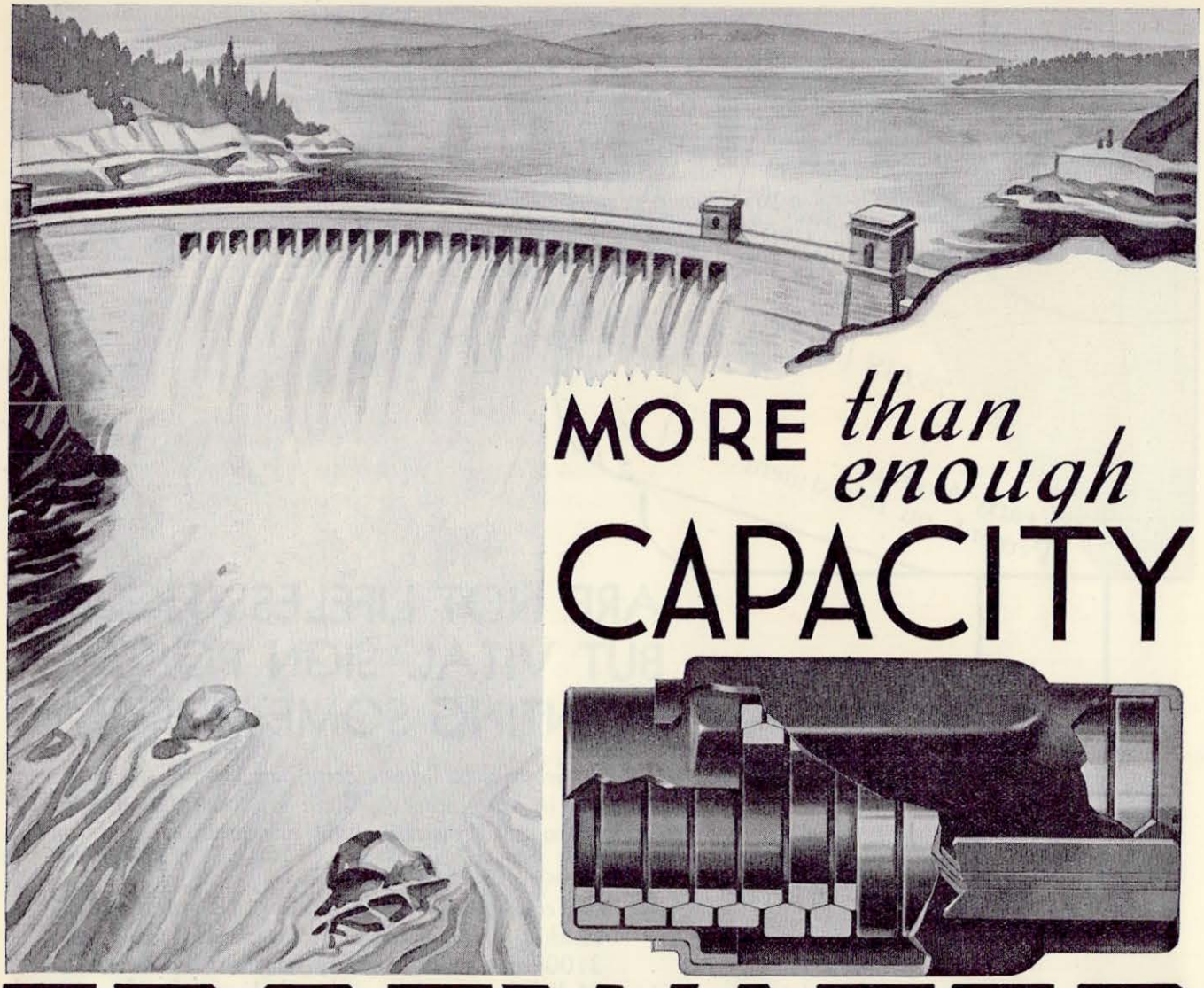
On another road, 22 Modern Locomotives of the 4-8-4 type, replacing twice as many locomotives of the 4-6-2 and 2-8-2 types, are saving approximately $900,000 per annum, an annual return of 38 per cent on the investment. They have eliminated 650,000 train miles a year, accelerated schedules 10 to 15 per cent and show a ten per cent fuel saving on the basis of gross ton-miles per pound of coal.

These are sign posts pointing the way to savings in locomotive operating and maintenance expenses and better net operating income.

It takes Modern Locomotives to make money these days!

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA



MORE *than enough* CAPACITY

EDGEWATER

RING SPRING DRAFT GEAR

IN a reservoir Capacity is a vital necessity. The same is true of a Draft Gear.

Capacity measures the cushioning power of a Draft Gear. The Edgewater B-32-K Gear has greater capacity than any other Gear fitting the standard A. R. A. pocket. It thus provides the greatest safeguard against shocks to car and lading.

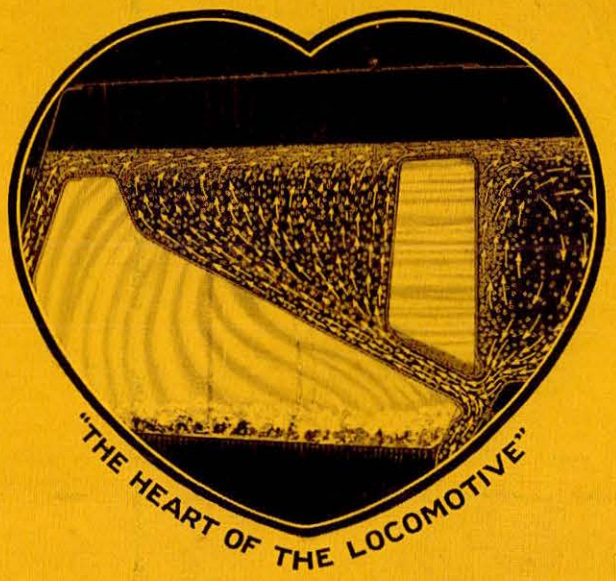
Edgewater B-32-K Gear gives "more than enough" Capacity to meet the A. R. A. Specifications, and all of this is available for car protection.

EDGEWATER STEEL COMPANY
PITTSBURGH PENNSYLVANIA

Sales Offices:

Atlanta
Baltimore
Boston
Chicago
Kansas City
Louisville
New York
Philadelphia
San Francisco
St. Louis
Seattle
St. Paul
Washington

Improved Engineering

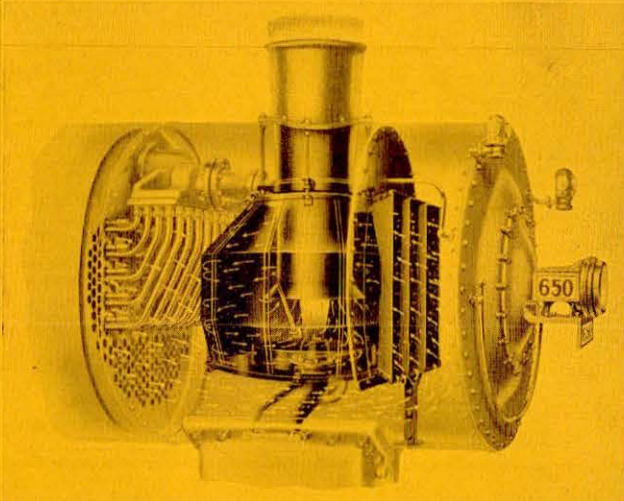


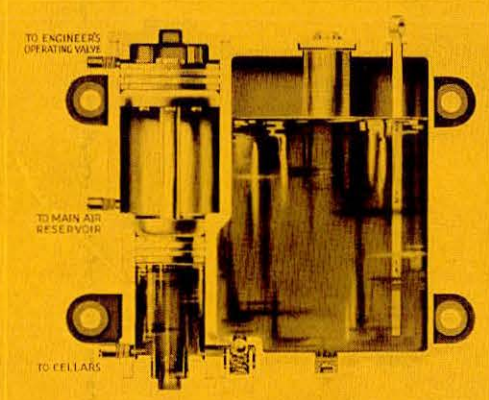
Nicholson Thermic
SYPHONS

By adding effective heating surface and creating rapid circulation, Syphons increase locomotive boiler efficiency 8.47%. They improve locomotive performance, reduce maintenance costs and provide unfailing safety. Syphons are recognized standard for old and new passenger, freight and switching locomotives.

CYCLONE
Spark Arresters

The cyclonic movement of the gases and cinders breaks up and quenches the sparks without use of netting and with no restriction of draft. Permits use of semi-bituminous or lignite coal without sparks. The Cyclone Spark Arrester is invaluable in territories where fire hazards are extreme. Now in service on more than 400 locomotives.





CHRISTY
Pneumatic Lubricators

Provides a manually operated pneumatic system supplying oil under pressure to engine and trailer truck cellars, preventing delays due to hot boxes and insuring continuous lubrication with minimum attention.

LOCOMOTIVE FIREBOX COMPANY

NEW YORK CHICAGO MONTREAL

Improved Methods • Efficient Service • Economy of Results

under supervision of

Dearborn Laboratories

Your Assurance Against Locomotive Water Troubles

Dearborn Cleaners

for All Purposes

There are five Dearborn Cleaners used extensively in railroad service. They are of different strengths and are highly efficient in the uses recommended. Selection of the correct Dearborn Cleaner effects a saving in quantity and assures reliable results with a minimum of labor.

Write for Samples

Samples of Dearborn Cleaners for trial will be supplied gladly without cost. Inquiries invited.

Since this company was founded on the idea of scientific correction of harmful tendencies in boiler waters, improvement of method has been the watchword.

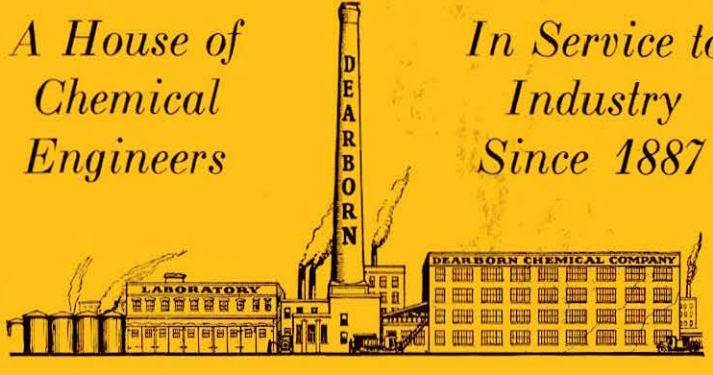
The great Dearborn Laboratories have been engaged for nearly a half century in this development work, moving forward conservatively and surely. Dearborn methods represent selections of treating materials and their introduction in the boiler based upon "workability", economy and thoroughness of results.

The railroad companies employing Dearborn are safe in the knowledge that prevention of scale formation, foaming, pitting, corrosion and embrittlement in their locomotive boilers is in the hands of a competent, responsible organization which recognizes only complete correction of these troubles as the satisfactory result.

Confident with experience, young in viewpoint, eager for the problems of tomorrow, Dearborn invites your consultation on the maintenance of satisfactory locomotive boiler water conditions on your railroad. Address us at 310 South Michigan Avenue, Chicago; 205 East 42nd Street, New York; 2454-64 Dundas Street, W., Toronto.

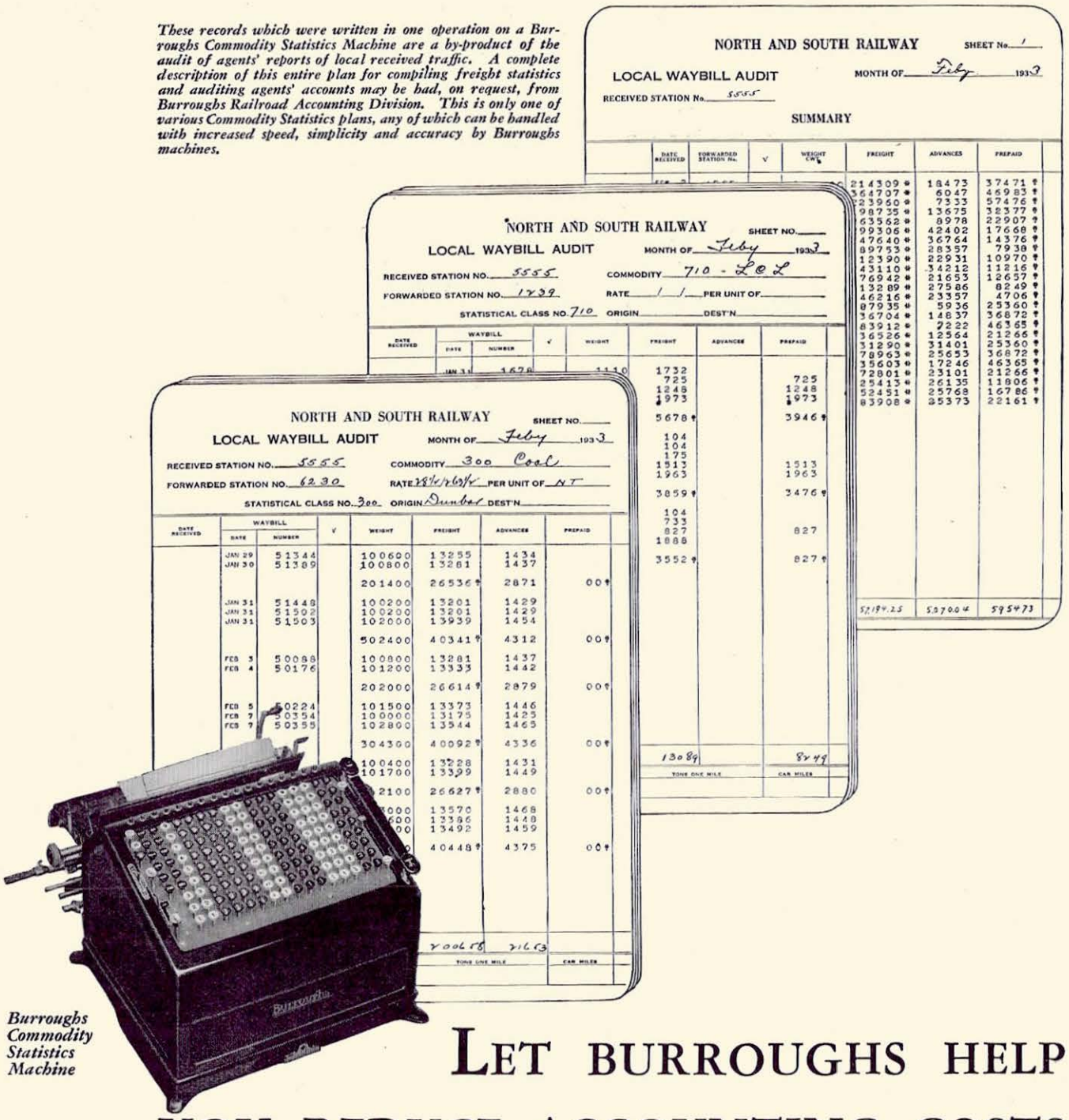
A House of Chemical Engineers

In Service to Industry Since 1887



DEARBORN CHEMICAL COMPANY

These records which were written in one operation on a Burroughs Commodity Statistics Machine are a by-product of the audit of agents' reports of local received traffic. A complete description of this entire plan for compiling freight statistics and auditing agents' accounts may be had, on request, from Burroughs Railroad Accounting Division. This is only one of various Commodity Statistics plans, any of which can be handled with increased speed, simplicity and accuracy by Burroughs machines.



Burroughs Commodity Statistics Machine

LET BURROUGHS HELP YOU REDUCE ACCOUNTING COSTS

Due to the recent developments in Burroughs machines, many roads have effected substantial savings in time, labor and money through the installation of such accounting equipment as Burroughs Commodity Statistics Machine.

There are many other new Burroughs machines especially designed for railroad accounting work . . . many other jobs that they handle with surprising ease, economy and accuracy.

To learn more about these new machines—these new developments—telephone the nearest Burroughs office or write direct to the Burroughs Railroad Accounting Division in Detroit.

BURROUGHS ADDING MACHINE COMPANY · (*Railroad Accounting Division*) · DETROIT, MICHIGAN

Burroughs

For SERVICE AND DELIVERY

MAGNUS METAL

Bronze Engine Castings, Satco Lining Material,
Car & Locomotive Journal Bearings

WHERE RECORDS ARE MADE YOU
WILL FIND MAGNUS PRODUCTS

"MAGNUS PRODUCTS ARE BRASS INSURANCE"

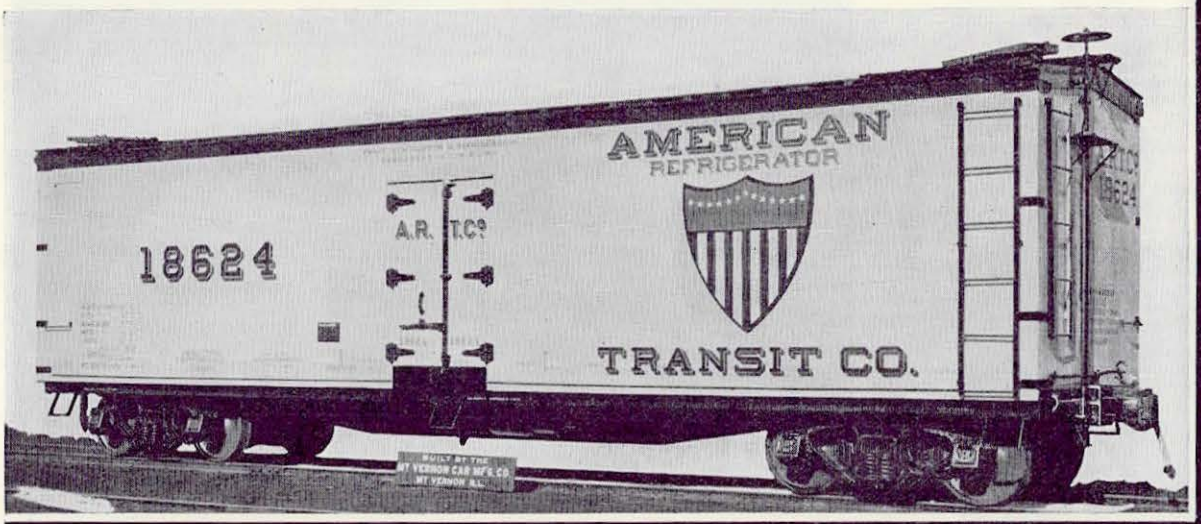
MAGNUS COMPANY

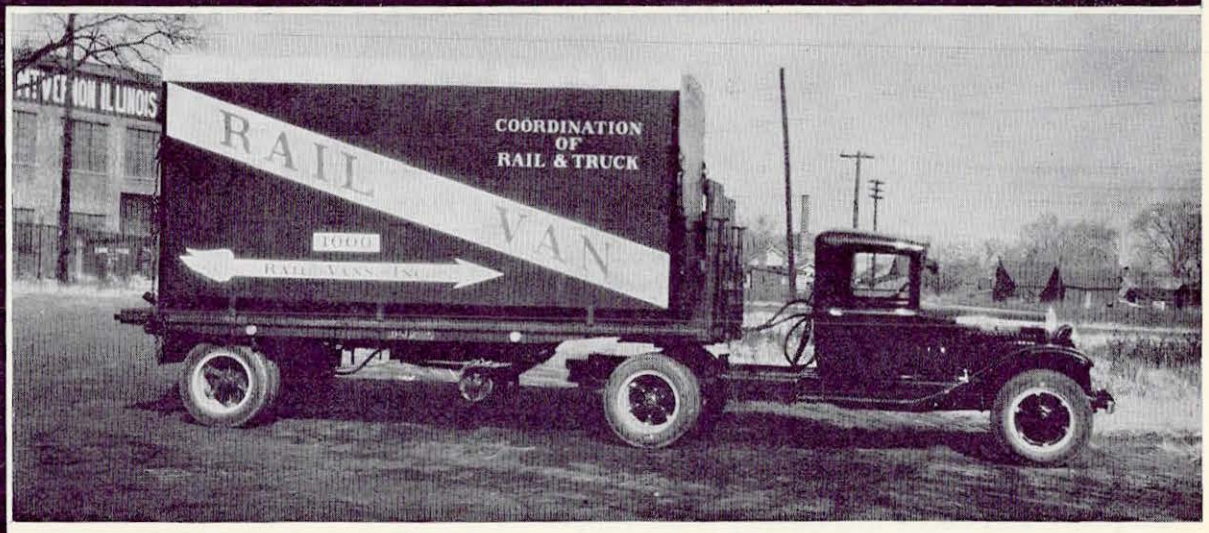
INCORPORATED

NEW YORK CHICAGO

WRITE *MAGNUS* IN YOUR SPECIFICATIONS

FREIGHT CARS
OF ALL TYPES



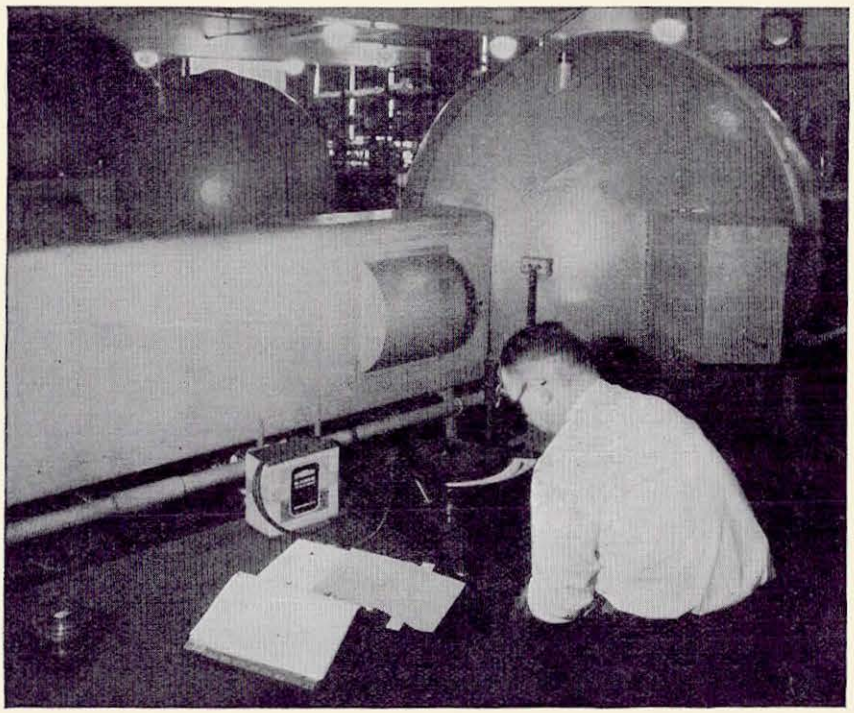


AND FREIGHT CONTAINERS
for Co-ordinated Service

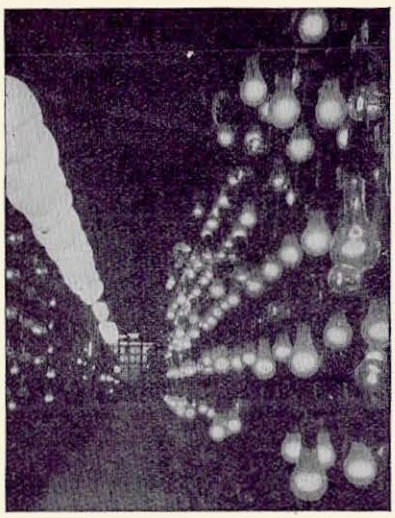
Our annual capacity is 12,000 freight cars, 125,000 Chilled Tread Wheels, and 20,000 Tons of Forgings of all types. We also maintain facilities for rebuilding and repairing freight cars.

Our latest contribution to freight transportation is the Rail Van. This container facilitates the co-ordination of railway and truck transportation. Your inquiry will bring complete descriptive details.

MT. VERNON CAR MFG. CO.
MT. VERNON, ILLINOIS



● Typical, and important lamp test is the Life Test. Random samples from factory output are placed on racks, such as illustrated below, and lighted until they burn out. The amount of light given off by each lamp is checked, by means of spherical photometers such as shown at the right before the test and at several times while it is going on. Thus is G. E. MAZDA lamp quality zealously guarded.



What the GENERAL ELECTRIC LIGHTING LABORATORIES *mean to the railroads . . . .*

● General Electric MAZDA lamps used by railroads vary all the way from tiny tubular lamps used in diagram service to 2,000-watt lamps for floodlighting. But in each of these lamps must be the same high General Electric quality.

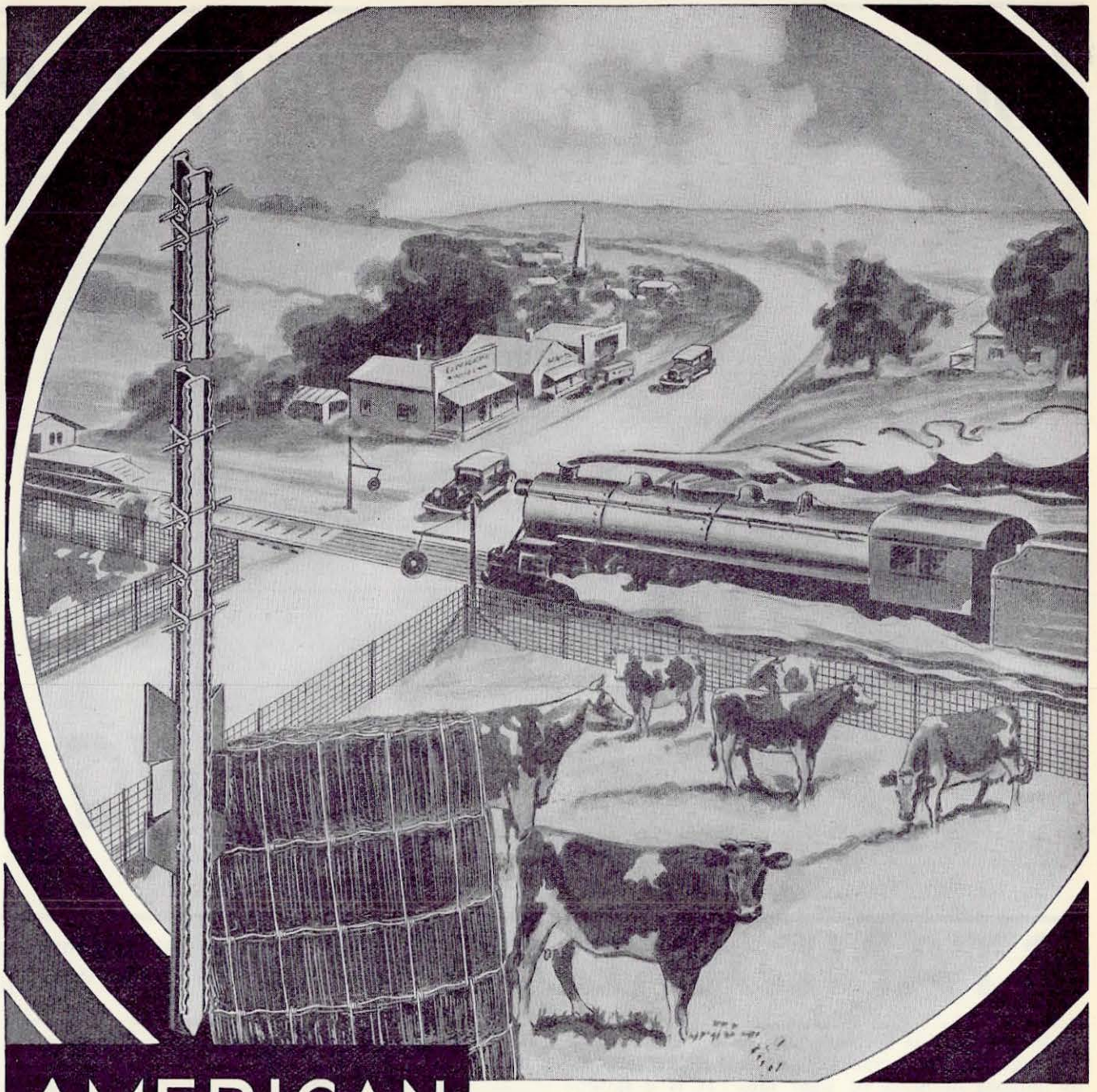
To prove and check this quality is the function of the G. E. testing laboratories, a section of which is shown above. Here, a definite percentage of every type of G. E. MAZDA lamp, selected at random from every lot made, undergo exhaustive tests. These not only provide an excellent measure of lamp performance in use, but assure conformity with G. E. standards.

To develop and improve lamp quality is the job of another group of G. E. scientists. Working in close cooperation with the railroads of the country, one group of these men keeps constantly looking ahead, trying to anticipate railroad lighting needs. At the same time, another is continually developing ways to make existing types of lamps even better suited to railroad operating conditions.

All of which says, just as plainly as we can say it, that when you use General Electric MAZDA lamps, you are getting the best lamps for your purposes that Nela Park, "Lighting Headquarters of the World", can produce. General Electric Company, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC

MAZDA LAMPS



AMERICAN Fence and BANNER STEEL POSTS

What About The Right-Of-Way?

Millions are spent protecting life and property at crossings, but what about the Right-of-Way?

The best way to reduce stock claims is to enclose the Right-of-Way. The most economical protection is offered by American Railroad Fence and Banner Steel Line Posts. These products, including National Expanding Anchor End and Corner Posts, meet all specifications of the American Railway Engineering Association. Write for a personal consideration of your problems.

1831 MORE THAN 100 YEARS OF PROGRESS IN WIRE MAKING 1933

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago
94 Grove Street, Worcester

SUBSIDIARY OF UNITED STATES STEEL CORPORATION
AND ALL PRINCIPAL CITIES

Empire State Bldg., New York
First National Bank Bldg., Baltimore

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York

How much have you PAID FOR

SHELLING

STANDARD "QT" Quenched and Tempered Wrought Steel Wheels

Shelling, which is a breakdown of the tread metal causing numerous cracks, has resulted in the loss of millions of miles of wear life. It is a fatigue failure of the steel and can only be overcome by increasing the strength, toughness and hardness of the steel.

A comparison of the physical properties of the "QT" wheel and the untreated wheel is shown in the accompanying table. Actual service tests have proved that this increase in quality, which is due to quenching and tempering process, eliminates wear metal loss caused by shelled treads.

PHYSICAL PROPERTIES

Type Wheel	Tensile Strength lb. per sq. in.	Elastic Limit lb. per sq. in.	Elongation in 2 in. per cent	Reduction of Area
Q. T. Wheel	170,000	100,000	12.0	22.0
Untreated Wheel	130,000	72,000	10.0	14.0

STANDARD STEEL WORKS COMPANY

SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

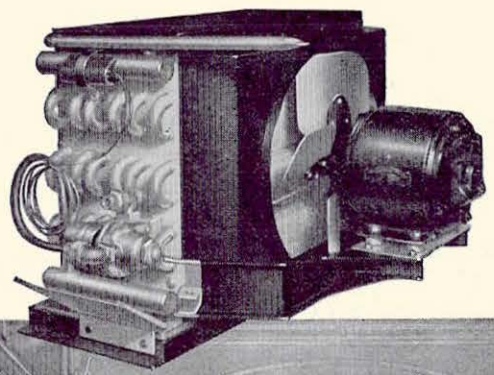
GENERAL OFFICES & WORKS: BURNHAM, PENNA.

CHICAGO ST. LOUIS PORTLAND
NEW YORK SAN FRANCISCO PHILADELPHIA AKRON

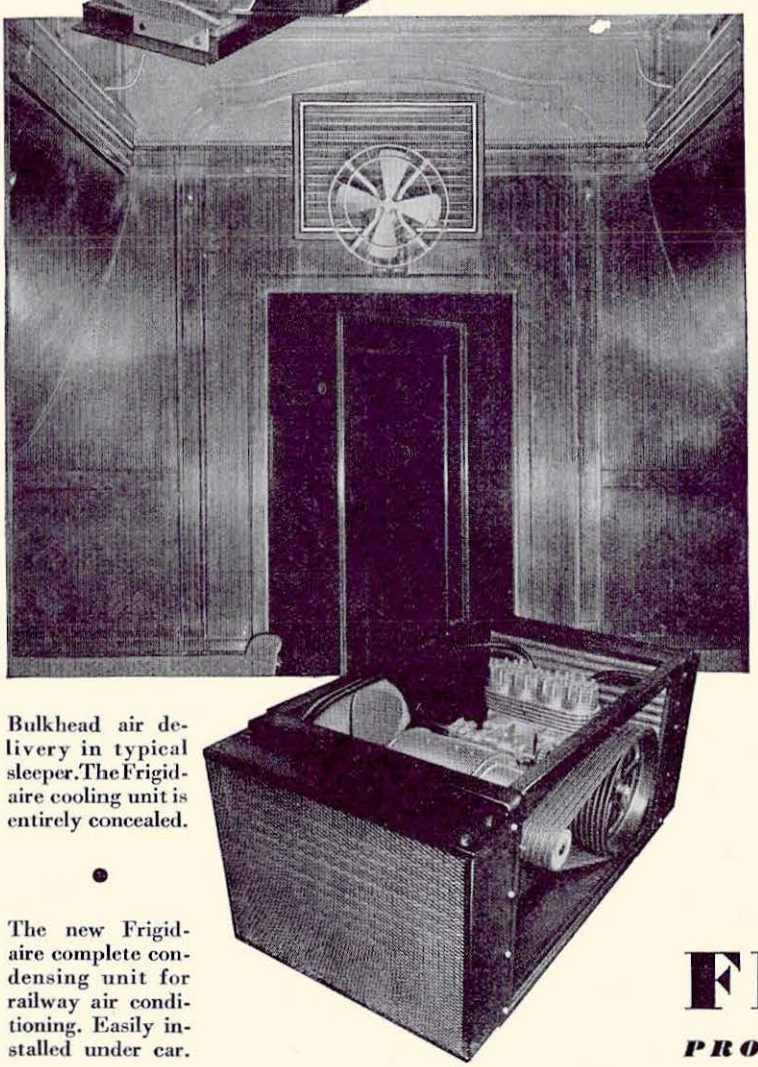
Frigidaire offers

air conditioning equipment

for quick, easy installation on present rolling stock



A Frigidaire cooling unit for sleeping cars. It requires only electrical and refrigerant connections to put it into operation.



Bulkhead air delivery in typical sleeper. The Frigidaire cooling unit is entirely concealed.

The new Frigidaire complete condensing unit for railway air conditioning. Easily installed under car.

Today you can have dependable air conditioning equipment on diners, sleepers and coaches without the necessity of expensive changes. Frigidaire has developed railway air conditioning equipment that can be easily and quickly installed with just a few inexpensive alterations.

This means that you can hold your investment in new equipment to an absolute minimum—yet put your passenger trains in condition to gain and hold the preference of the traveling public.

This Frigidaire Railway Air Conditioning Equipment has been thoroughly road-tested in all sections of the country—under all climatic conditions. It has been proved in every conceivable way. And the units are so compactly built, so light in weight and so expertly designed that they do not take up a single inch of revenue-producing space.

Furthermore, in addition to cleaning and cooling the air in summer, this Frigidaire equipment will also heat the air in winter when fitted with special heating coils. Nor is that all. A. C.—D. C. motors can be supplied for the condensing units, making possible operation in terminals from yard power lines. Freon (F-12)—the new safe refrigerant—is used in every installation.

If you are looking for ways and means of increasing year 'round passenger traffic, we suggest that you investigate Frigidaire now. Our engineers will be glad to call at any time that may suit your convenience. Frigidaire Corporation, Subsidiary of General Motors Corporation, Dayton, Ohio.

FRIGIDAIRE

PRODUCT OF GENERAL MOTORS

PROVEN PRINCIPLES

OF PASSENGER CAR TEMPERATURE REGULATION

Adapted to

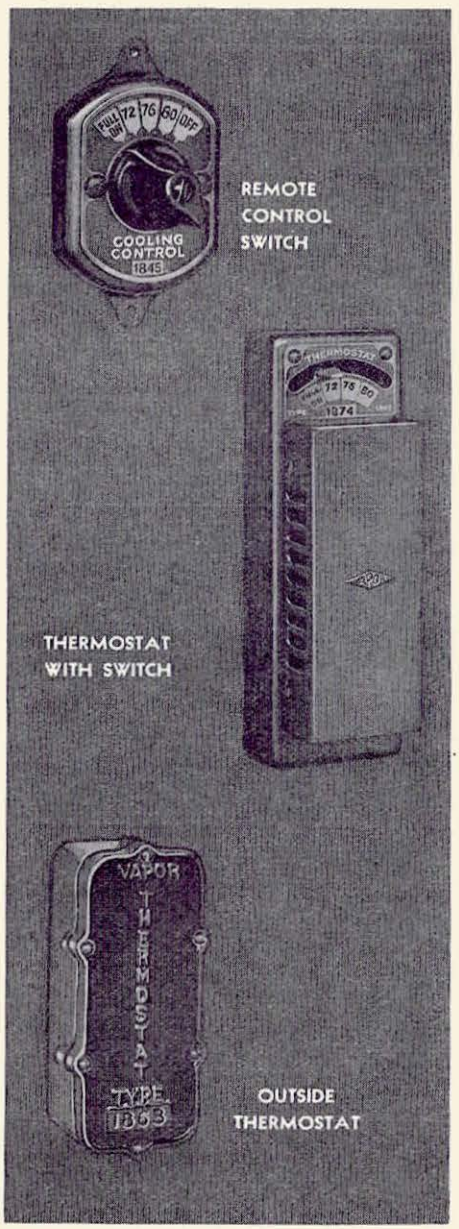
AIR-CONDITIONING

The Vapor Car Heating Company developed and perfected Automatic Temperature Regulation, standard on practically all railroads.

The same *dependable* principles have been incorporated in the Vapor Company's new *Controls* for *Air-Conditioning.*

Scientifically designed, Vapor Controls include many of the same parts and assemblies used in our Standard Automatic Temperature Regulation equipment, thus *standardizing* maintenance parts for Heating and Air Conditioning.

Correct Controls for Air-Conditioning of railway cars present problems distinctly unique, and are best solved by specialists in passenger car temperature regulation.



VAPOR COMPANY CONTROLS ARE:

- Entirely automatic—also determining by *outside* temperatures whether heating or cooling shall be in operation.
- Super-sensitive—to a fraction of a degree.
- Unaffected by vibration—a common cause of control troubles.
- Unaffected by corrosion, altitude or climatic changes.
- Supplied for Remote Control and in Single-Unit type.
- Adaptable to all types of passenger car Air-Conditioning.

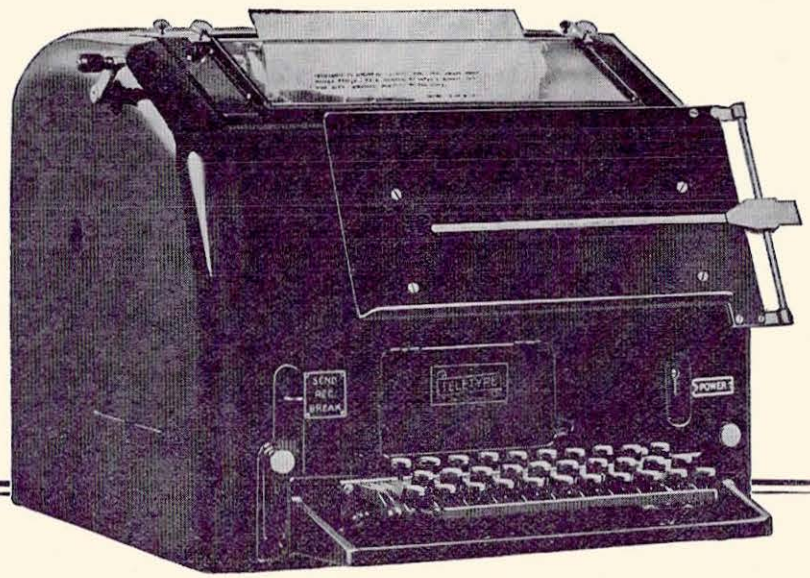
Specify
VAPOR CONTROLS
for Air-Conditioning.

VAPOR CAR HEATING CO. Inc.

RAILWAY EXCHANGE, CHICAGO, ILLINOIS

CAR HEATING SPECIALTIES FURNISHED BY CAR HEATING SPECIALISTS

Cut operating costs *with* TELETYPE



One road's Teletype installation cost..$9,000.00
In one year, this installation saved..$12,000.00
...just one of many cases in railroad operation

Teletype has proved a big money saver for many leading railroads. It has helped to keep down 1932 operating costs on the New York Central, Pennsylvania, Southern Pacific, Illinois Central, Union Pacific, Santa Fe, B. & O., Rock Island and other roads. It will effect great savings in 1933.

Operated just like a typewriter, Teletype transmits typewritten messages instantly over your road's own telegraph or telephone wires. It more than pays its way in efficient and economical handling of general message traffic, train announcements in terminals, dispatching from yard offices to switch towers, reporting car arrivals to trace bureaus, sending consists, wheel reports and car diversion orders.

By duplexing or multiplexing, Teletype can transmit two to eight messages simultaneously on one circuit. Today's operating conditions make the time and money saving communication services of Teletype more important than ever.

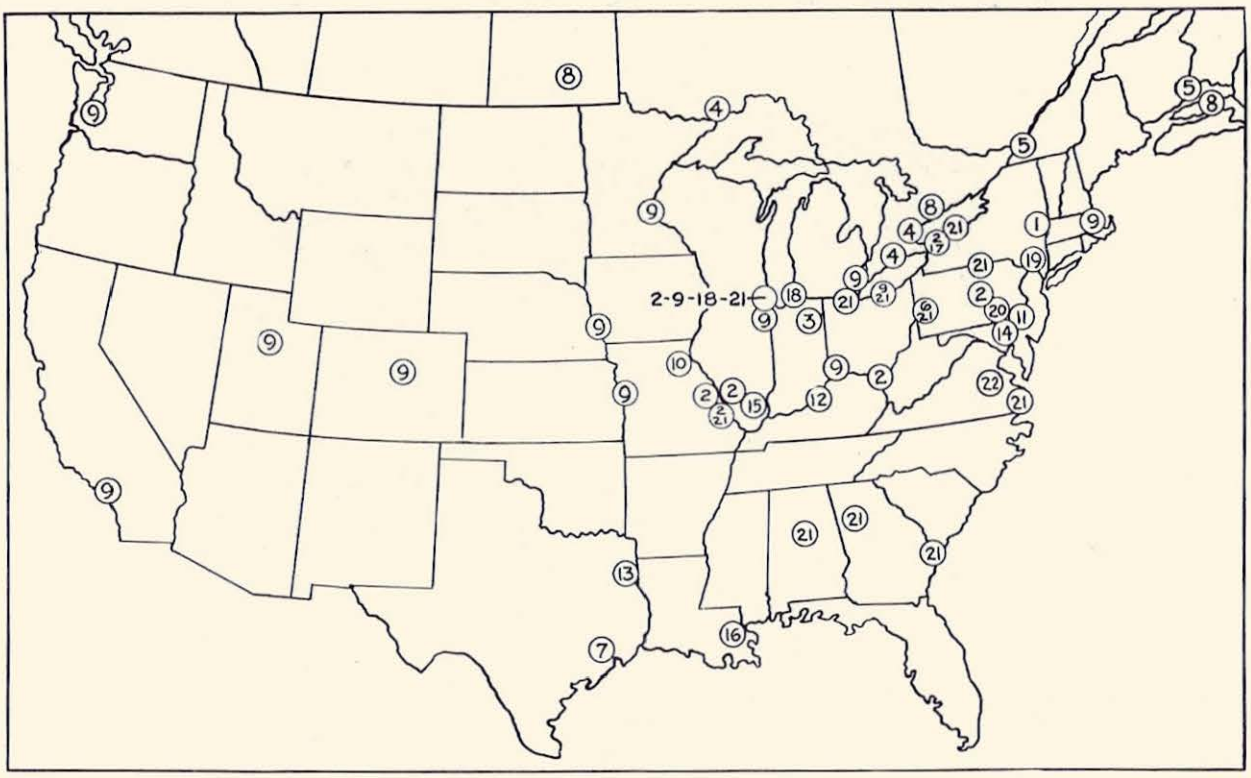
Our engineers will gladly assist you in fitting Teletype service to your needs. For full information, address the Teletype Corporation, 1400 Wrightwood Avenue, Chicago, Ill.

TELETYPE
SUBSIDIARY OF
Western Electric Company

Association of Manufacturers of Chilled Car Wheels

1847 McCormick Bldg. **Chicago, Illinois**

THERE ARE 56 CHILLED WHEEL FOUNDRIES LOCATED THROUGHOUT THE UNITED STATES AND CANADA



—MEMBERSHIP—

1. Albany Car Wheel Co.
2. American Car & Fdry. Co.
3. Bass Fdry. & Machine Co.
4. Canada Iron Foundries, Ltd.
5. Canadian Car & Fdry. Co.
6. Central Car Wheel Co.
7. Dickson Car Wheel Co.
8. Dominion Wheel & Fdries., Ltd.
9. Griffin Wheel Co.
10. Hannibal Car Wheel & Fdry. Co.
11. Lobdell Car Wheel Co.
12. Louisville Car Wheel & Ry. Sup. Co.
13. Marshall Car Wheel Co.
14. Maryland Car Wheel Co.
15. Mt. Vernon Car Wheel Mfg. Co.
16. New Orleans Car Wheel Co.
17. New York Car Wheel Co.
18. Pullman Car & Mfg. Corp.
19. Ramapo Fdry. & Wheel Works
20. Reading Car Wheel Co.
21. Southern Wheel Co.
22. Tredegar Iron Works

The Chilled Car Wheel Industry organized this Association twenty-five years ago for the sole purpose of developing the design, manufacture and serviceability of the Chilled Car Wheel for use under all classes of railroad and industrial equipment.

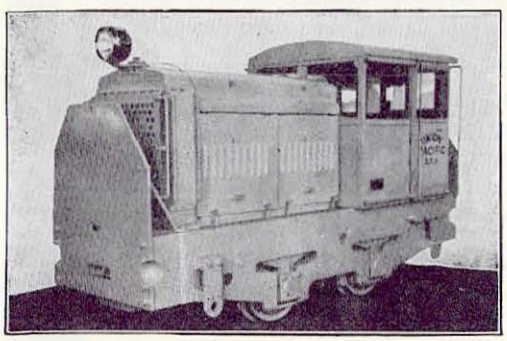
A staff of engineers is constantly working in the Association chemical and physical laboratories, conducting experiments and tests for the continual improvement of the Chilled Car Wheel.

THE CHILLED CAR WHEEL IS STANDARD FOR ALL CLASSES OF FREIGHT, ENGINE AND TENDER TRUCK SERVICE IN ACCORDANCE WITH AMERICAN RAILWAY ASSOCIATION SPECIFICATIONS

EXPERIENCE TEACHES

the Lessons of HAULAGE ECONOMY with WHITCOMBS

Scene at Carey, Baxter & Kennedy operations, York City, where Whitcomb locomotives are used.



One of many Whitcomb Gasoline Locomotives in Tie-Treating plant service.

Whitcomb Type and Sizes

Whitcomb Locomotives are available in 2-ton to 80-ton sizes, including Gasoline mechanical drive, Diesel mechanical drive, Gasoline-Electric, Diesel-Electric, Electric Storage Battery, Electric Trolley and the various combinations of these major power sources.

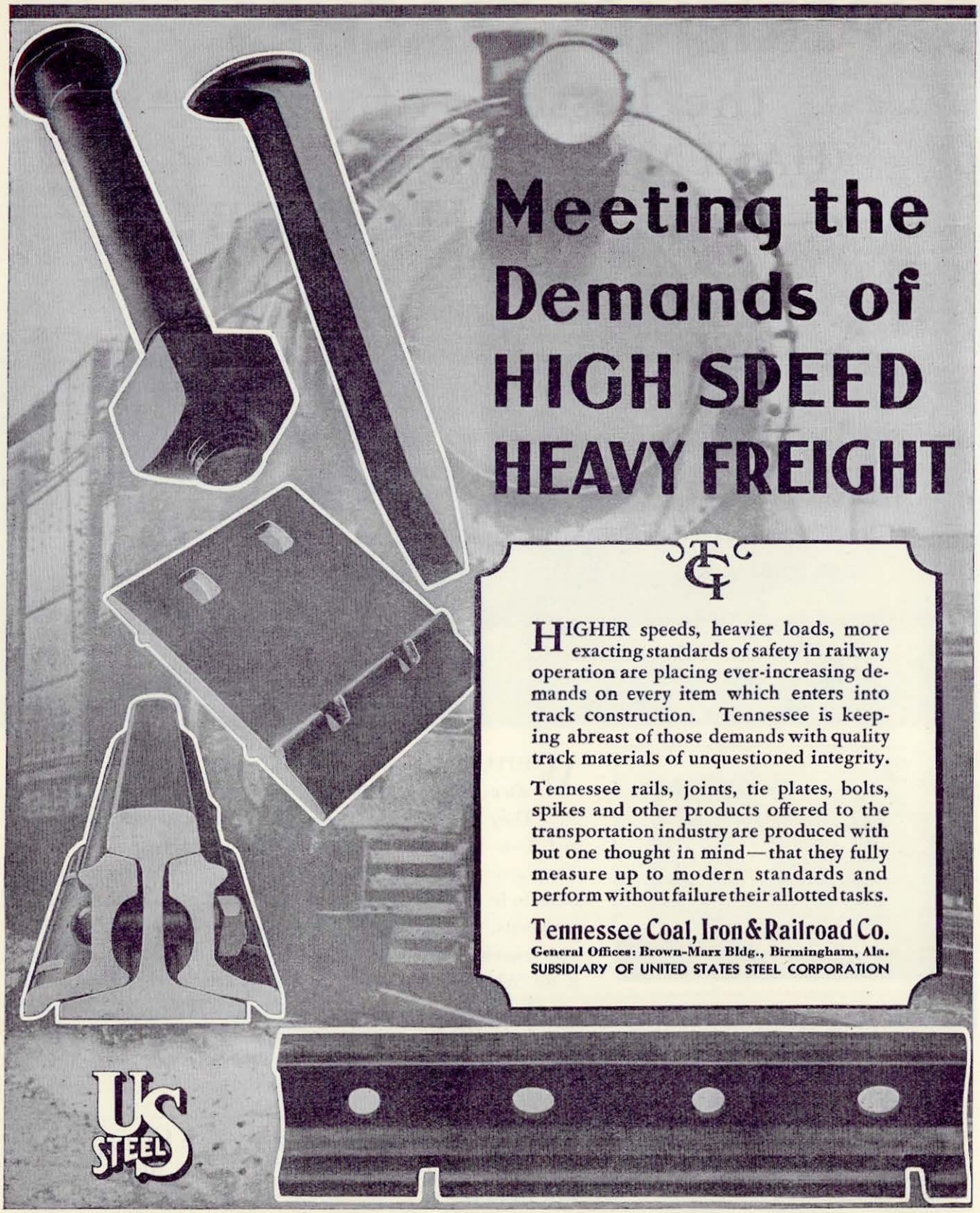
WHITCOMB operating records give FACTS. . . . Day after day, year after year, such records PROVE things. . . . They prove Greater Haulage Capacity, Lower Investment and Less Operating Costs for Whitcomb Locomotives. . . . They prove it in railway construction where Whitcombs have come to be standard equipment. . . . They prove it in tie treating plants, material storage yards, car repair shops, switch yards and branch lines where Whitcombs are used. . . . They prove it for Whitcombs in many other secondary power operations. . . . Let us analyze your operations. . . . We can supply you with valuable data and comparative operating cost records. . . . Write, phone or wire. . . . Sales and service facilities everywhere.

The Whitcomb Locomotive Company

Subsidiary of The Baldwin Locomotive Works

ROCHELLE ILLINOIS

WHITCOMB LOCOMOTIVES



Meeting the Demands of HIGH SPEED HEAVY FREIGHT

HIGHER speeds, heavier loads, more exacting standards of safety in railway operation are placing ever-increasing demands on every item which enters into track construction. Tennessee is keeping abreast of those demands with quality track materials of unquestioned integrity.

Tennessee rails, joints, tie plates, bolts, spikes and other products offered to the transportation industry are produced with but one thought in mind—that they fully measure up to modern standards and perform without failure their allotted tasks.

Tennessee Coal, Iron & Railroad Co.
General Offices: Brown-Marx Bldg., Birmingham, Ala.
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

USS STEEL

TENNESSEE TRACK MATERIALS

Maintenance Engineers *say*—

"Eighty-five percent of rail renewal is made necessary by batter and chipping of the rail ends." • The Oxweld process of building up battered or chipped rail ends adds years to the life of rail, reduces maintenance costs and improves the riding quality of the track. • Thousands of miles of rail is built up each year on the leading Railroads under Oxweld Railroad Service supervision.

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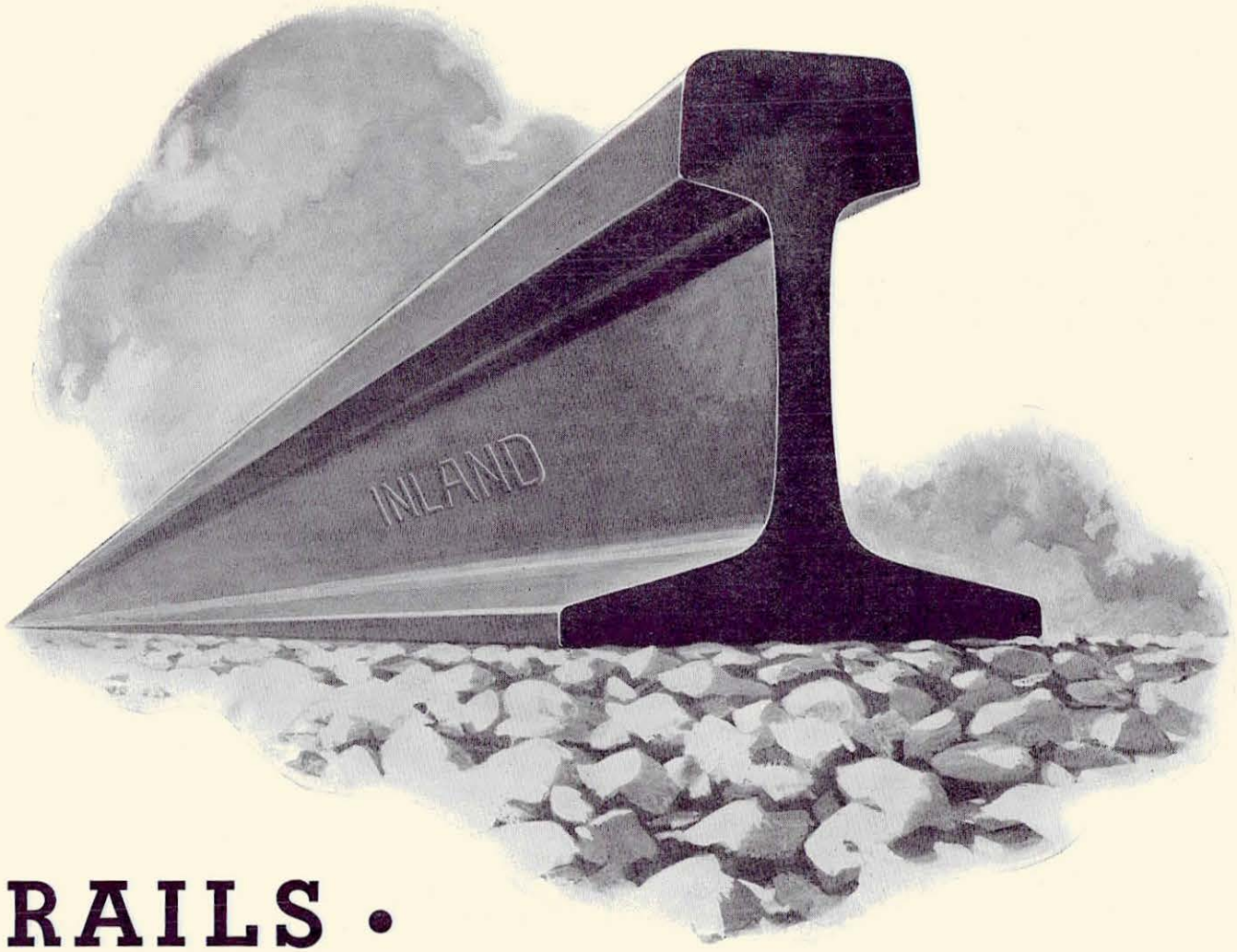

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And in addition to these track materials, Inland is your logical source of supply for steel sheet piling, steel fence posts (Red Top), 4-Way floor plates, roofing, bars, plates, structurals, sheets, strip, Copper-Alloy steel, and numerous other steel products. INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago, Illinois.

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INTERNATIONAL HARVESTER ENTERS LOW-PRICE TRUCK FIELD

Announces Half-Ton 6-Cylinder Model to Sell at $360

for 113-inch wheelbase chassis f.o.b. factory (tax extra). Every type of body available to meet every requirement.

$360

chassis f.o.b. factory (tax extra)

Rated Capacity: 1/2-ton.
Wheelbase: 113 inches.
Engine: 6-cylinder, L-head type, 3-5/16-inch bore x 4-1/8-inch stroke. Develops 70 horsepower. Exhaust valve seat inserts. Full pressure lubrication. Down-draft carburetion. Air cleaner.
Clutch: 9-inch single plate, with built-in vibration damper.
Rear Axle: Spiral-bevel gear type. Hotchkiss type final drive. Chrome-molybdenum axle shafts, pressed steel housing. Tapered-roller differential and axle-shaft bearings.
Brakes: 4-wheel mechanical, 2-shoe type, self-energizing, internal-expanding and cable-controlled.
Springs: Semi-elliptic. All leaves of chrome-vanadium steel. Self-adjusting spring shackles.
Wire wheels: 40-spoke, 18-inch with 5.25-18 balloon tires.
Standard equipment includes trumpet horn, spare wire wheel, fender well tire carrier, front and rear fenders, and full-length running boards. All instruments attractively grouped in panel on dash.

THOUSANDS of truck users have long looked for a half-ton model from International Harvester. They have missed International *quality* in the low-price field.

For it is on *quality* that International Harvester built its outstanding success. Because of *quality* it has steadily increased its leadership among full-line truck manufacturers, greatly improving its relative position during the recent difficult years.

It has established this record on chassis prices never lower than six hundred dollars and ranging up to more than six thousand. High reputation, dependable performance, and unfailing service have brought new International buyers in increasing thousands.

Now new conditions have given us our opportunity. *Today* International provides another product of high quality in the new International Half-Ton Model D-1.

This new 6-cylinder truck at its remarkably low International price takes with it every guarantee that every International Truck carries. It is safeguarded by the nation-wide service that makes every International more valuable to its owner throughout the years of its life.

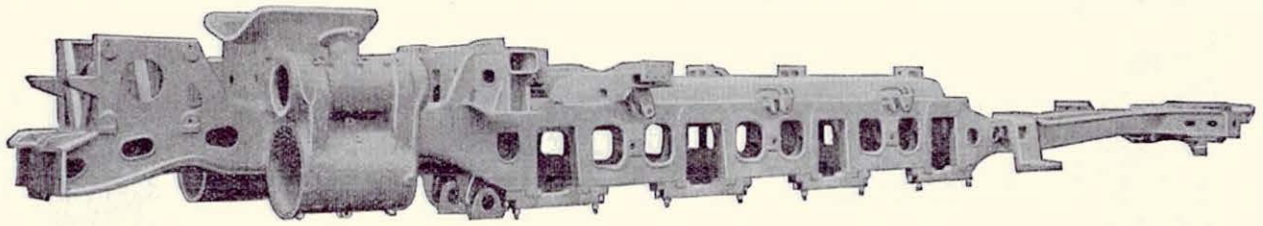
You are cordially invited to visit any International Branch or dealer and see this new half-ton International.

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. OF AMERICA *(Incorporated)* Chicago, Illinois

INTERNATIONAL TRUCKS

OFTEN REPEATED BY MECHANICAL DEPARTMENT MEN—

"Commonwealth Beds Greatly Reduce Cost of Locomotive Repairs"



CAST STEEL LOCOMOTIVE BED WITH INTEGRAL CYLINDERS, REAR CYLINDER HEADS, AND AIR RESERVOIR

"Here's Why"—

A one-piece steel casting properly designed

•

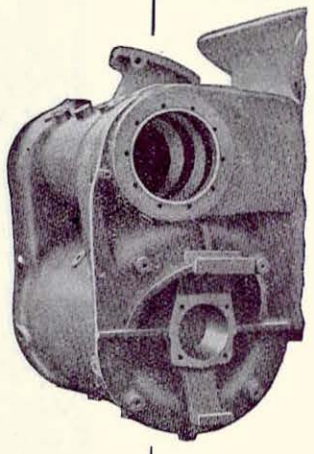
Eliminates many separate parts and hundreds of bolts

•

Insures maximum strength throughout •

Preserves true alignment of frame structure, cylinders and moving parts at all times

VIEW SHOWING INTEGRAL REAR CYLINDER HEAD AND GUIDE BAR SUPPORTS

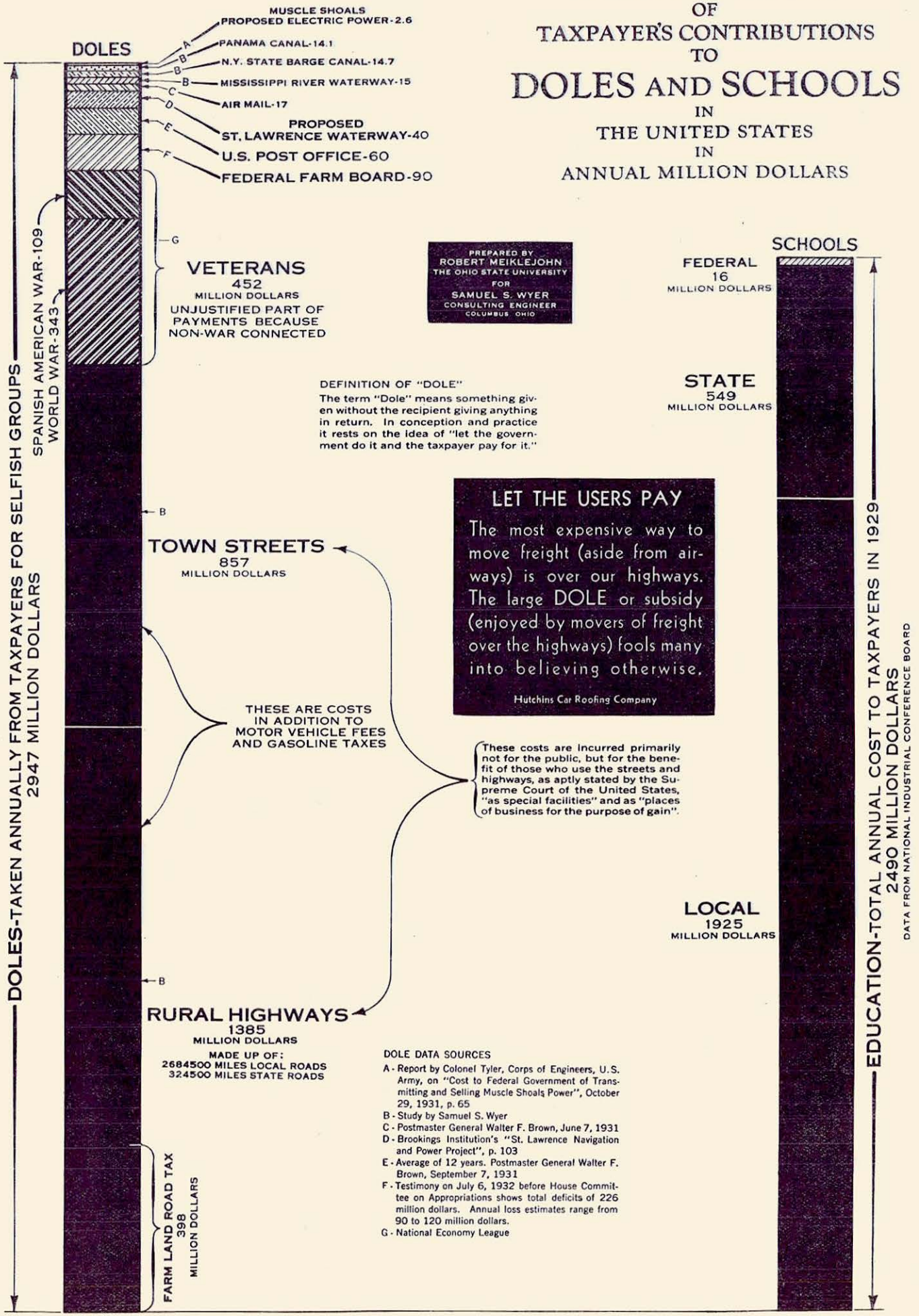


GENERAL STEEL CASTINGS CORPORATION

COMMONWEALTH PRODUCTS

EDDYSTONE, PA. GRANITE CITY, ILL.

COMPARISON OF TAXPAYER'S CONTRIBUTIONS TO DOLES AND SCHOOLS IN THE UNITED STATES IN ANNUAL MILLION DOLLARS


DOLES
MUSCLE SHOALS PROPOSED ELECTRIC POWER-2.6
PANAMA CANAL-14.1
N.Y. STATE BARGE CANAL-14.7
MISSISSIPPI RIVER WATERWAY-15
AIR MAIL-17
PROPOSED ST. LAWRENCE WATERWAY-40
U.S. POST OFFICE-60
FEDERAL FARM BOARD-90
A
B
B
B
C
D
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F
G
VETERANS
452
MILLION DOLLARS
UNJUSTIFIED PART OF PAYMENTS BECAUSE NON-WAR CONNECTED
SPANISH AMERICAN WAR-109
WORLD WAR-343
DOLES-TAKEN ANNUALLY FROM TAXPAYERS FOR SELFISH GROUPS
2947 MILLION DOLLARS
PREPARED BY
ROBERT MEIKLEJOHN
THE OHIO STATE UNIVERSITY
FOR
SAMUEL S. WYER
CONSULTING ENGINEER
COLUMBUS OHIO
SCHOOLS
FEDERAL
16
MILLION DOLLARS
STATE
549
MILLION DOLLARS
DEFINITION OF "DOLE"
The term "Dole" means something given without the recipient giving anything in return. In conception and practice it rests on the idea of "let the government do it and the taxpayer pay for it."
LET THE USERS PAY
The most expensive way to move freight (aside from airways) is over our highways. The large DOLE or subsidy (enjoyed by movers of freight over the highways) fools many into believing otherwise.
Hutchins Car Roofing Company
B
TOWN STREETS
857
MILLION DOLLARS
THESE ARE COSTS IN ADDITION TO MOTOR VEHICLE FEES AND GASOLINE TAXES
These costs are incurred primarily not for the public, but for the benefit of those who use the streets and highways, as aptly stated by the Supreme Court of the United States, "as special facilities" and as "places of business for the purpose of gain".
LOCAL
1925
MILLION DOLLARS
B
RURAL HIGHWAYS
1385
MILLION DOLLARS
MADE UP OF:
2684500 MILES LOCAL ROADS
324500 MILES STATE ROADS
FARM LAND ROAD TAX
398
MILLION DOLLARS
EDUCATION-TOTAL ANNUAL COST TO TAXPAYERS IN 1929
2490 MILLION DOLLARS
DATA FROM NATIONAL INDUSTRIAL CONFERENCE BOARD

DOLE DATA SOURCES

A - Report by Colonel Tyler, Corps of Engineers, U.S. Army, on "Cost to Federal Government of Transmitting and Selling Muscle Shoals Power", October 29, 1931, p. 65

B - Study by Samuel S. Wyer

C - Postmaster General Walter F. Brown, June 7, 1931

D - Brookings Institution's "St. Lawrence Navigation and Power Project", p. 103

E - Average of 12 years. Postmaster General Walter F. Brown, September 7, 1931

F - Testimony on July 6, 1932 before House Committee on Appropriations shows total deficits of 226 million dollars. Annual loss estimates range from 90 to 120 million dollars.

G - National Economy League

RAILWAY AGE

Railway Trends in 1932 and Prospects for 1933

Past developments indicate, and it is to be hoped that future developments will show, that the most important fact about the railroad business and about general business in 1932 was that their trends changed at the end of last summer. When a motorist has gone down a long hill and has just started up another hill he is still lower than when he began to go down, but higher than when he was at the bottom.

The best single measure of the total volume of business done in the United States is the amount of freight shipped by railroad, because nothing is shipped which is not purchased by somebody, sold by somebody and bought by somebody. Throughout the 35 months from October 1, 1929, to September 1, 1932, the trend of freight shipments was steadily downward. In 1930 car loadings were 13 per cent less than in 1929. In 1931 they were 29.5 per cent less than in 1929. In 1932 they were 46.5 per cent less than in 1929. But there was a marked difference in the trends of loadings in the last one-third of 1932 and in the last one-third of the preceding two years.

Trend of Freight Business

Freight business reached relatively the lowest level of the depression in July, 1932; and the change in the trend of business that occurred in the last one-third of 1932 can be best shown by comparing car loadings in July of each of the three depression years, 1930, 1931 and 1932, with loadings in the subsequent months of those years. Average weekly loadings in the last six months of each of these years are given in the accompanying table.

Average Total Car Loadings Per Week July-December Inclusive, 1930, 1931 and 1932

	1930	Per Cent Inc. or Dec. Compared with July	1931	Per Cent Inc. or Dec. Compared with July	1932	Per Cent Inc. or Dec. Compared with July
July	895,078		732,692		477,862	
Aug.	938,012	+ 4.8	749,457	+ 2.2	551,553	+15.4
Sept.	931,422	+ 4.1	726,988	− 0.7	561,150	+17.4
Oct.	950,270	+ 6.2	762,691	+ 4.0	631,621	+32.2
Nov.	797,836	−10.9	654,926	−10.6	548,802	+14.8
Dec.	679,289	−24.1	555,190	−24.2	497,366	+ 4.1

In all years when the trend of general business is normal there is a seasonal increase of freight shipments in August and the fall months. The figures given in the table show that the usual seasonal increases did not occur in the fall months of 1930 or 1931. There were increases in August, September and October, 1930, over July, and in August and October, 1931, over July; but they were much smaller than normal, and in November and December of both years loadings sharply declined. On the other hand, in the last one-third of 1932 loadings in each month were substantially larger than in July, the increase in October over July being as much as 32 per cent. The sharpest contrast is presented by the figures for July and December of these three years. In 1930 car loadings were 215,789 per week, or 24 per cent, *less* in December than in July. In 1931 they were 177,502 per week, or again 24 per cent, *less* in December than in July. In 1932 they were 19,504 per week, or 4 per cent, *more* in December than in July.

Improvement in Net Earnings

Of course, both general business and railroad freight business were smaller throughout 1932, including the last one-third of it, than for many years. What everybody has been looking for is evidence, not that business is becoming good, but that it has begun to improve. The figures of car loadings afford evidence that it has begun to improve; and equally convincing evidence of other kinds could be presented. Whatever may be the future trend, it is a fact that a downward trend of freight business in the last one-third of a year almost invariably has presaged poor business during the next year, while an upward trend in the last one-third of a year almost invariably has been the forerunner of improving business during the next year.

The change in the trend of freight business caused

an even more marked change in the trend of railway net operating income. The net operating income earned by the Class I roads averaged $19,000,000 a month in the first eight months of the year, while it averaged about $45,000,000 a month in the last four months of the year, the amount earned in the last one-third of the year being substantially larger than the total earned in the first two-thirds of the year. That it increased during the last one-third of the year is the only favorable thing that can be said regarding the net operating income of 1932, for it amounted to only about $330,000,000, the smallest figure of the same kind reported since 1897.

The improvement in traffic and earnings was accompanied by an increase in railway employment. In August the number of employees of the Class I roads had declined to 996,317. Normally the number of employees declines during the last one-third of the year, but in September, 1932, it increased to 1,010,440; in October to 1,033,225; and in November it was still 1,013,178, or larger than in August. This increase in employment was accompanied by a corresponding increase in purchases.

Retarding Governmental Influences

Whether the upward trend of business that prevailed during the last one-third of 1932 will be maintained during 1933 is, of course, conjectural. Business is still very bad, and its recent improvement can be continued only by the solution of many difficult problems. The strongest retarding influences are influences of government. The tax burden being borne by industry, commerce and all classes of the people from reduced incomes is almost unbearable, and the difficulty of getting men in public office to make reductions of local, state and national government expenditures is extremely great.

If men in public office were subject only to pressure for reductions of expenditures the problem would be rapidly solved; but they are subject also to pressure from organized minorities against reductions in the number and pay of government employees and for increases in soldiers' bonuses, subsidies to farmers, and expenditures upon public works; and the pressure of the taxeaters has thus far largely counterbalanced the pressure of the taxpayers. The question of international debts hangs over business like a pall, and any settlement of it would be better than its continued unsettlement; but politics affects the consideration of all important questions that must be settled by government, and, in consequence, there is almost interminable delay in getting any constructive action, or any action at all, regarding them.

However, progress unquestionably is being slowly made in effecting readjustments of many kinds that are necessary to a continuing improvement in business. Readjustments already made, and increasing confidence and courage among business men and the public generally, explain the improvement that already has occurred, and there seems good reason to hope that the operation of economic forces will overcome the resistance of organized minorities, and that the improvement already begun will continue.

Reduction of Railway Purchases

As the railroad problem is one of the most important and difficult with which the nation is confronted, a revival of the earning, employing and purchasing capacity of the railways will make one of the greatest contributions to economic recovery. Never have the capital expenditures of the railways for equipment and improvements, or their expenditures for maintenance, been so drastically curtailed as in 1932. While 1,452 miles of line were abandoned, only 163 miles of new railway line were constructed, the smallest mileage built in any year since the Civil war. The new mileage built in the five years ending with 1929 averaged 824 miles annually. Total trackage (all tracks) built in 1932 was 168 miles. Total trackage built in the five years ending with 1929 averaged 1,275 miles annually. The total tonnage of rail laid in 1932 was about 520,000 tons. The tonnage of rail laid in the five years ending with 1929 averaged 2,111,000 tons annually.

No electric locomotives and only three steam locomotives were ordered by United States railways in 1932, and these three were built by the Great Northern in its own shops. The number of locomotives ordered in 1931 was 235, and the number ordered in the five years ending with 1929 averaged 981 annually. Only 1,968 freight cars were ordered by United States railways in 1932, and more than 1,600 of these were built in railroad shops. The number ordered in 1931 was 10,880, and the average number ordered in the five years ending with 1929 was 78,854. Total expenditures for all maintenance of equipment and maintenance of way in 1932 were only about $980,000,000. The expenditure for all maintenance in 1931 was $1,365,000,000, and the average expenditure for all maintenance in the five years ending with 1929 was $2,100,000,000 annually.

Railway Expenditures After Depression of 1921

While the reductions of expenditures for construction, equipment and maintenance in 1932 were more drastic than any ever previously made, very drastic reductions have been made in past depressions, and it is worthwhile at this time to recall the very large increases in expenditures that subsequently occurred. Total trackage built increased from an average of 592 miles annually in the three years ending with 1922 to an average of 1,285 annually in the five years ending with 1927. The number of locomotives ordered declined to 239 in the depression year 1921. The number ordered increased in 1922 to 2,600, and in 1923 was 1,944. The number of freight cars ordered in 1921 was only 23,346. The number ordered in 1922 was

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Capital expenditures increased from $429,000,000 in 1922 to an annual average of $868,000,000 in the next five years. It is impossible to make satisfactory comparisons between maintenance expenditures in the depression years 1921-22 and in the immediately subsequent years because of the changes in wages and prices that occurred; but it is well-known that there was a great increase in the amount of labor and materials used in making up the deferred maintenance that developed during the depression a decade ago.

Effects of Truck Competition

The causes of the reductions of railway employment and purchases within the last three years are but too familiar. Gross earnings declined from about $6,400,000,000 in 1929 to about $3,200,000,000 in 1932. This made necessary a reduction of more than $2,000,000,000 in annual operating expenses. In spite of this reduction of operating expenses, which, of course, involved corresponding reductions of employment and purchases, net operating income declined about 75 per cent. This reduction of net operating income made it impossible for most railways to finance improvements, and, in consequence, capital expenditures declined relatively more than maintenance expenditures.

The large loans made to the railways by the government have saved many of them, temporarily at least, from bankruptcy, but the only way in which most of them can be saved from bankruptcy and in which their employing and purchasing capacity can be restored is by an increase in their gross and net earnings. The principal cause of the decline in their gross earnings has been the depression, but there has been another cause the effects of which usually have been greatly underestimated. Research made in the seventeen Mississippi valley states indicates that the freight handled by the trucks in those states last year would have, if handled by the railways, yielded them freight revenues of more than $180,000,000. As about one-third of the country's freight business is handled in that territory, and as truck competition is universally prevalent, it seems probable that, in the entire country, the trucks handled freight in 1932, which, if it had been handled by the railways, would have yielded them freight revenues in excess of $500,000,000. Even this figure takes no account of the loss in freight revenues sustained by the railways because of reductions of rates made to meet truck competition.

The net interest of the railways on their net funded debt is about $570,000,000 annually. Therefore, it would appear that the losses of freight earnings they are suffering owing to truck competition are not far from equal to the interest on their entire funded debt. Stating the matter in another way, the railway freight revenues lost because of truck competition last year would have been sufficient on the present basis to have paid the wages of about 300,000 additional railway employees.

National Uprising Against Unregulated Trucks

It is obvious, therefore, that, although any revival of general business and increase of traffic would be helpful, a revival of general business is not the only thing required to put the railways back on their feet. If the waterway and highway competition which is depriving them of so much of their traffic and earnings were fair, the railway problem presented would be quite different. As the competition is wholly unfair, because of differences in national and state government policies affecting the railways and their competitors, it is not surprising that there is a national uprising against it.

There is ample reason for anticipating that this uprising will result in national and state legislation which will give the railways the "equality of opportunity" for which they ask. The most powerful influence working for the elimination of unfair competition is that of railway employees, who have taken the lead in all parts of the country in organizing railway employees' and taxpayers' associations which are demanding the withdrawal of subsidies from competing carriers, especially commercial carriers by highway, and the application to them of regulation comparable to that applied to the railways.

Among the most significant developments last year was the crystallization of a sentiment among numerous classes of shippers for withdrawal of subsidies from trucks and for their regulation. Truckers in all parts of the country have been engaging not only in competition with the railways, but also with men in other lines of business, by buying numerous commodities and dumping them on already demoralized markets regardless of the effects, not only on freight rates, but upon commodity prices. It has been only a short time since many spokesmen of shippers opposed truck regulation upon the ground that there was no demand for it from shippers. Recently the outcry of many classes of shippers for truck regulation has become as loud as that of the railways and their employees. The railways are forbidden by law to deal commercially in commodities that they transport. It appears probable that, in addition to the demand of the railways and their employees for regulation of truck service and rates, there will develop a powerful demand from shippers for legislation to prohibit commercial truckers from buying and selling commodities that they transport.

Truck Lobbying and Propaganda

Organizations of truck manufacturers and operators are struggling desperately by means of lobbying and propaganda to prevent further legislation for such regulation of trucks as is demanded by the railways and to secure repeal of much of the legislation that has been passed. Their lobbying activities at state

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Railways Continue Policy

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A Review of Railway Operations in 1932

Despite depressing traffic and revenue returns the events of last year were not without "fringes of hope"

By Dr. Julius H. Parmelee
Director, Bureau of Railway Economics

FURTHER declines in railway traffic and revenues marked the year 1932, bringing the volume of American railway operations in that year to approximately one-half the volume of 1929. Net railway operating income declined to one-fourth of the total earned in 1929, while net income after fixed charges wholly disappeared, being replaced by a net deficit. In the relatively short space of three years, from 1929 to 1932, railway fortunes fell from the all-time peak level of freight movement to a level roughly equivalent to prewar days.

However dark the traffic and revenue returns of 1932 appear, events of the year were not without "fringes of hope." The Interstate Commerce Commission, in its annual report to Congress for 1932, emphasized certain "important grounds for encouragement" which could be found "in the midst of this gloom."

It may even be said that these "fringes" looked more promising than at the close of 1931, when certain unmistakable signs pointed towards a better understanding of railway problems by the public at large. That is not to prophesy that the railway problem seems definitely on the road to solution. Events of the past three years have added so many new problems to an already complicated situation that the ultimate solution may be delayed for a number of years. We can only point out that the thought directed towards the railroad situation has been characterized by a clearer conception of the problem.

Outstanding features of the operations and developments of 1932 were:

1. Drastic economy in operating costs, which led to an improved net income position toward the close of the year, despite continuing declines in operating revenues.
2. Financial assistance from the Reconstruction Finance Corporation and Railroad Credit Corporation.
3. Slight improvement in traffic from August to October.
4. Further development of intelligent public interest in the railway problem.

These features are briefly developed in succeeding paragraphs, and summarize the brighter spots in a year of otherwise unrelieved discouragement for the railway industry. They warrant the careful attention of all who are interested in the future welfare of the industry, which so closely underlies, and is so intimately related to, the economic welfare of the nation as a whole.

Economy in Operation

Railways in 1932 brought their operating expenses more drastically in line with their smaller revenues than would have seemed possible three years ago. The Commission's report for 1932 recognized this when it said: "The railroads have been in general surprisingly successful in reducing their operating expenses in a ratio reasonably close to the reduction in operating revenues."

Reference to Chart *D*, which appears at a later point in this review, will disclose the extent to which railway operating expenses were reduced in 1930, again sharply in 1931, and more sharply still in 1932. Statistical evidence will be found in a later section, dealing with the operating expenditures of 1932 in some detail. Total operating expenses were reduced 46.7 per cent from 1929 to 1932.

The statistical story of reduced operating costs is quickly told, but not so easy is it to tell the story behind the reduction, the thousands of economies adopted, the reductions in force, and finally the voluntary reduction in payrolls, by agreement between men and managements. This agreement resulted from a long series of negotiations between a committee of nine railway presidents, representing the carriers of the three districts, and the Railway Labor Executives' Association, comprising twenty labor groups. The agreement applied both to the railways, the Pullman Company, and the Railway Express Agency, Inc.

Under the agreement, which became effective on February 1, and was to remain in effect for one year, the carriers agreed to withdraw formal notices previously served on the men for a fifteen per cent wage reduction, and to make earnest efforts to maintain and increase railroad employment. The men agreed "that ten per cent shall be deducted from each pay check" of each of the employees covered by the agreement during the year ending January 31, 1933. The agreement further specifically provided that basic rates of pay should remain unchanged. Use of the word "deduction" rather than "reduction" in the agreement, and the provision as to basic rates, show the intent not to disturb the wage schedules, but to set up an arrangement that would temporarily help the financial situation.

That it did help is unquestioned, although the further declines in traffic and revenue that occurred during 1932 made it impracticable to maintain railway employment at their previous levels. The payroll saving from the ten per cent deductions, during the eleven months from February to December, 1932, cannot be computed with exactness, but newspaper estimates of the saving were generally much too high.

Late in 1932, this agreement was renewed along similar lines for another period of nine months, beginning with February and ending with October, 1933. This renewed agreement further specified that neither men nor managements would make any move toward changes in basic rates of pay prior to June 15, 1933.

Financial Assistance

Financial assistance came to individual railways from two definite sources in 1932, outside of the usual channels of financing. While the aggregate amount of out-

180,154, and in the four years ending with 1925 it averaged 127,732 annually.

Capital expenditures increased from $429,000,000 in 1922 to an annual average of $868,000,000 in the next five years. It is impossible to make satisfactory comparisons between maintenance expenditures in the depression years 1921-22 and in the immediately subsequent years because of the changes in wages and prices that occurred; but it is well-known that there was a great increase in the amount of labor and materials used in making up the deferred maintenance that developed during the depression a decade ago.

Effects of Truck Competition

The causes of the reductions of railway employment and purchases within the last three years are but too familiar. Gross earnings declined from about $6,400,000,000 in 1929 to about $3,200,000,000 in 1932. This made necessary a reduction of more than $2,000,000,000 in annual operating expenses. In spite of this reduction of operating expenses, which, of course, involved corresponding reductions of employment and purchases, net operating income declined about 75 per cent. This reduction of net operating income made it impossible for most railways to finance improvements, and, in consequence, capital expenditures declined relatively more than maintenance expenditures.

The large loans made to the railways by the government have saved many of them, temporarily at least, from bankruptcy, but the only way in which most of them can be saved from bankruptcy and in which their employing and purchasing capacity can be restored is by an increase in their gross and net earnings. The principal cause of the decline in their gross earnings has been the depression, but there has been another cause the effects of which usually have been greatly underestimated. Research made in the seventeen Mississippi valley states indicates that the freight handled by the trucks in those states last year would have, if handled by the railways, yielded them freight revenues of more than $180,000,000. As about one-third of the country's freight business is handled in that territory, and as truck competition is universally prevalent, it seems probable that, in the entire country, the trucks handled freight in 1932, which, if it had been handled by the railways, would have yielded them freight revenues in excess of $500,000,000. Even this figure takes no account of the loss in freight revenues sustained by the railways because of reductions of rates made to meet truck competition.

The net interest of the railways on their net funded debt is about $570,000,000 annually. Therefore, it would appear that the losses of freight earnings they are suffering owing to truck competition are not far from equal to the interest on their entire funded debt. Stating the matter in another way, the railway freight revenues lost because of truck competition last year would have been sufficient on the present basis to have paid the wages of about 300,000 additional railway employees.

National Uprising Against Unregulated Trucks

It is obvious, therefore, that, although any revival of general business and increase of traffic would be helpful, a revival of general business is not the only thing required to put the railways back on their feet. If the waterway and highway competition which is depriving them of so much of their traffic and earnings were fair, the railway problem presented would be quite different. As the competition is wholly unfair, because of differences in national and state government policies affecting the railways and their competitors, it is not surprising that there is a national uprising against it.

There is ample reason for anticipating that this uprising will result in national and state legislation which will give the railways the "equality of opportunity" for which they ask. The most powerful influence working for the elimination of unfair competition is that of railway employees, who have taken the lead in all parts of the country in organizing railway employees' and taxpayers' associations which are demanding the withdrawal of subsidies from competing carriers, especially commercial carriers by highway, and the application to them of regulation comparable to that applied to the railways.

Among the most significant developments last year was the crystallization of a sentiment among numerous classes of shippers for withdrawal of subsidies from trucks and for their regulation. Truckers in all parts of the country have been engaging not only in competition with the railways, but also with men in other lines of business, by buying numerous commodities and dumping them on already demoralized markets regardless of the effects, not only on freight rates, but upon commodity prices. It has been only a short time since many spokesmen of shippers opposed truck regulation upon the ground that there was no demand for it from shippers. Recently the outcry of many classes of shippers for truck regulation has become as loud as that of the railways and their employees. The railways are forbidden by law to deal commercially in commodities that they transport. It appears probable that, in addition to the demand of the railways and their employees for regulation of truck service and rates, there will develop a powerful demand from shippers for legislation to prohibit commercial truckers from buying and selling commodities that they transport.

Truck Lobbying and Propaganda

Organizations of truck manufacturers and operators are struggling desperately by means of lobbying and propaganda to prevent further legislation for such regulation of trucks as is demanded by the railways and to secure repeal of much of the legislation that has been passed. Their lobbying activities at state

capitals forcibly recall the similar lobbying activities which got the railways into so much trouble before the adoption of effective regulation. Their favorite propaganda device is to cite figures regarding the aggregate "taxes" paid by all owners of motor vehicles, including owners of private automobiles, and to claim that the railways are seeking an increase of motor vehicle "taxation" at a time when the entire nation is clamoring for reductions of taxes. Fortunately, law makers and the public are beginning to realize that charges made for commercial use of a highway, like charges made for commercial use of any other kind of public property, are not "taxes," but tolls, or rentals; that those who use public property should be required to pay adequate rentals for its use to help reduce the burden of taxation borne by real estate, other property and incomes; and that truck regulation is as necessary in the interest of producers and shippers as of the railways and their employees. Prospects for national and state truck legislation which will give the railways equality of opportunity in competition are, therefore, very good.

Railways Continue Policy of Co-ordination

While the conflict between the railway and motor vehicle interests over legislation and regulation became hotter than ever last year, the railways continued and expanded the program of co-ordination of railway and highway service which they have been pursuing for a number of years. While railway operation of motor coaches was merely maintained approximately at the level reached in 1931, railway use of motor trucks continued to grow at a rapid pace. Motor trucks used in connection with freight train service represent one of the most important means adopted by the railways last year in their determined efforts to recover freight traffic which they have lost to highway competitors. Better freight service resulted from the expansion of the store-door pick-up and delivery service of the railways. More railways arranged for the extension of transportation to the doors of shippers and consignees, with the result that this type of service is now provided in all parts of the country except the central east and the far southeast and in certain sections of the northwest. In addition to their utilization of trucks to perform pick-up and delivery service, the railways continued to substitute many trucks for local train service, and, in at least one instance, began an extensive experiment with the use of motor trucks to effect the delivery of carload freight, with results which indicate that such motorization of terminal operations is both efficient and economical.

One of the interesting developments of last year was the creation of the "Joint Committee of Railroads and Highway Users" for the purpose of trying to reach an agreement between the two interests regarding the matters in controversy between them. The report of this body is summarized in the news section of this issue. The railroad committee appointed by the Association of Railway Executives consists of the following: W. W. Atterbury, president, Pennsylvania Railroad; L. W. Baldwin, president, Missouri Pacific; Ralph Budd, president, Burlington; George B. Elliott, president, Atlantic Coast Line; J. J. Pelley, president, New Haven; Paul Shoup, vice-chairman, Southern Pacific. The committee appointed by the National Highway Users' Conference is composed of the following: Albert H. Swayne, president, General Motors Corporation; Arthur M. Hill, president, National Association Motor Bus Operators; R. C. Holmes, president, Texas Company; Robert P. Hooper, representing the American Automobile Association; Clarence O. Sherrill, representing the National Chain Stores Association, and Louis J. Taber, master of the National Grange.

Those portions of the report of this committee upon which both railroad and highway members were able to agree, while falling considerably short of a really adequate code for the control of motor transport in the public interest, nevertheless contain definite concessions by motor vehicle interests from the extreme views heretofore expressed by many of their spokesmen. They concede complete regulation of bus lines and regulation of common carrier trucks in practically all essentials except rates, together with some slight control of contract carriers. Common and contract carriers by truck, however, are not directly represented on this committee, and many of the former are known to be strong advocates of rate regulation. The motor transport members of the committee also join the railroad delegation in a statement of principles for determining reasonable fees for the use of the highways, and agree that railways should pay no more toward grade crossing elimination costs than the capitalization of resultant savings in railway operating expenses. The committee recommends that it be continued and, if it is, further bases for agreement may be found.

Railway Employment and Wages

The agreement reached at the end of January, 1932, between the committee of nine railway presidents and officers of the railway labor unions for a 10 per cent deduction from basic wages for one year expired at the end of January, 1933. During the latter part of 1932 negotiations were conducted looking, on the part of the railways, to a larger reduction of wages. An agreement finally was reached to continue the 10 per cent deduction until October 31, 1933, and providing, in effect, that in case the railways should on June 15 or thereafter begin proceedings under the Railway Labor act for a permanent reduction of wages, the labor organizations would join in national negotiations in order to avoid delays in settlement that would occur if conferences were undertaken by all the individual railways and their various classes of employees.

In the five years ending with 1929 the average number of employees of Class I roads was 1,740,567, and their average annual compensation was $2,929,345,799.

In 1930 the number of employees was 1,510,687 and their compensation $2,590,274,843. In 1931 the number of employees was 1,278,014 and their compensation $2,127,181,287. In 1932 the number of employees was about 1,050,000 and their total compensation about $1,420,000,000. The number of employees in 1932 was, therefore, about 690,600 less than the average number in the five years ending with 1929, and their compensation about $1,500,000,000 less than it averaged annually in the five years ending with 1929. The number of employees was the smallest since 1900 and their total compensation the smallest since 1916.

The average railway wage per hour was maintained at the highest level in history throughout 1930 and 1931, and at a level only ten per cent lower in 1932. This maintenance of wages largely accounts for the inability of the railways to reduce their operating costs sufficiently to offset, as well as they did in past depressions, the decline in their earnings, and also undoubtedly is largely responsible for the terrific and unprecedented reduction made in the number of their employees.

Facing the New Conditions

Both the employees and the railways are confronted with new conditions. The cost of living has declined much more during the depression than railway wages. One reason why it is so difficult for the railways to meet truck and water competition by reductions of freight rates is that the wages being paid by the railways are so much higher than those being paid by carriers by water and highway. Furthermore, because of the decline of commodity prices, and especially of prices of farm products and other raw materials, the railways are meeting with increasing pressure for reductions of rates. General reductions of passenger rates are in prospect. Freight rates must be readjusted in accordance with what traffic can bear under new economic and competitive conditions. It seems reasonably sure, therefore, that important downward readjustments of wages will be made in 1933.

The present railway situation is highly unsatisfactory and a menace to the nation. Although the trend of freight business has now been upward for five months, car loadings in January, 1933, were still about 44 per cent less than in January, 1930, 33 per cent less than in 1931, and 15 per cent less than in 1932. Unless traffic and earnings rapidly improve many railway companies will have to continue to get large loans from the Reconstruction Finance Corporation or go into receivership.

Nevertheless, the railway situation is improving and promises to continue to improve. There are in prospect an increase of traffic, helpful truck legislation and a further reduction of wages. Many important operating economies have been effected during the depression which will be permanent; and each of the favorable influences that have been mentioned will tend to cause a relatively greater increase in net operating income than in gross earnings. Public sentiment regarding the railways and proposed constructive federal and state legislation in their behalf is more favorable than it ever was before. There is much reason to believe that President-elect Roosevelt fully realizes the gravity and importance of the railway problem and will assume leadership in helping to solve it. Therefore, as bad as business and the railway situation still are, those who desire to see the earning, employing and purchasing capacity of the railways restored have more reason for taking a hopeful view of the future than they have had at any time within three years.

Suppose Stores Were Regulated As Railways Are

"Let us suppose we have two department stores across the street from each other. The one on the south side is completely regulated by the government. It is required by law to carry a full stock of all department store goods. It must sell them at governmentally fixed prices, which are alike to all. It must supply any customer with any goods demanded. The scale of prices is fixed on the theory that certain goods can stand fairly liberal profits, while others must be sold at or close to cost, or perhaps even below cost, if the needs of customers for those goods are to be met at all. That is to say, some prices, considered by themselves, are attractively remunerative. Others are less so. Some are not remunerative at all. The entire structure of prices, as a whole, is intended to be so adjusted that with average buying by the public, spread out over the various classes of goods, a reasonable return, but no more than that, may be earned upon the entire business.

"If such a store had no competitors except other stores similarly regulated, it could not complain of unequal conditions of competition. But, let us assume this is not the case. Suppose the competing establishment on the north side of the street is entirely free from regulation. Its owners are then at liberty to use their own discretion about what goods to carry and what prices to charge. Naturally, they will stock up heavily with the lines of merchandise having the larger margins of profit. On these lines they can underbid the regulated store enough to get most of that class of business. They can carry smaller stocks of the less remunerative goods, and need not carry any of those considered to be unprofitable.

"Under such conditions, the regulated store might do a large gross business and still have little or no net earnings, or even a loss. The unregulated store, on the other hand, might show handsome net earnings out of a much smaller turnover, by the simple plan of concentrating on the heavy profit goods, and leaving to its competitor the burden of supplying the demand for the unprofitable lines, which, by law, it would be required to meet.

"A regulated railroad is practically in the situation of the imaginary regulated department store. An unregulated trucking enterprise is substantially in the position of the imaginary unregulated store. There can be no such thing as equality of opportunity between rail and highway carriers while these differences of regulation exist. The remedy required is a simple one, viz., to place truck transportation under adequate regulation, just as it was found necessary half a century or so ago to undertake the regulation of the railroads."

—From an address by C. B. Sudborough, Vice-Pres., Penn. R. R.

A Review of Railway Operations in 1932

Despite depressing traffic and revenue returns the events of last year were not without "fringes of hope"

By Dr. Julius H. Parmelee
Director, Bureau of Railway Economics

FURTHER declines in railway traffic and revenues marked the year 1932, bringing the volume of American railway operations in that year to approximately one-half the volume of 1929. Net railway operating income declined to one-fourth of the total earned in 1929, while net income after fixed charges wholly disappeared, being replaced by a net deficit. In the relatively short space of three years, from 1929 to 1932, railway fortunes fell from the all-time peak level of freight movement to a level roughly equivalent to prewar days.

However dark the traffic and revenue returns of 1932 appear, events of the year were not without "fringes of hope." The Interstate Commerce Commission, in its annual report to Congress for 1932, emphasized certain "important grounds for encouragement" which could be found "in the midst of this gloom."

It may even be said that these "fringes" looked more promising than at the close of 1931, when certain unmistakable signs pointed towards a better understanding of railway problems by the public at large. That is not to prophesy that the railway problem seems definitely on the road to solution. Events of the past three years have added so many new problems to an already complicated situation that the ultimate solution may be delayed for a number of years. We can only point out that the thought directed towards the railroad situation has been characterized by a clearer conception of the problem.

Outstanding features of the operations and developments of 1932 were:

1. Drastic economy in operating costs, which led to an improved net income position toward the close of the year, despite continuing declines in operating revenues.
2. Financial assistance from the Reconstruction Finance Corporation and Railroad Credit Corporation.
3. Slight improvement in traffic from August to October.
4. Further development of intelligent public interest in the railway problem.

These features are briefly developed in succeeding paragraphs, and summarize the brighter spots in a year of otherwise unrelieved discouragement for the railway industry. They warrant the careful attention of all who are interested in the future welfare of the industry, which so closely underlies, and is so intimately related to, the economic welfare of the nation as a whole.

Economy in Operation

Railways in 1932 brought their operating expenses more drastically in line with their smaller revenues than would have seemed possible three years ago. The Commission's report for 1932 recognized this when it said: "The railroads have been in general surprisingly successful in reducing their operating expenses in a ratio reasonably close to the reduction in operating revenues."

Reference to Chart *D*, which appears at a later point in this review, will disclose the extent to which railway operating expenses were reduced in 1930, again sharply in 1931, and more sharply still in 1932. Statistical evidence will be found in a later section, dealing with the operating expenditures of 1932 in some detail. Total operating expenses were reduced 46.7 per cent from 1929 to 1932.

The statistical story of reduced operating costs is quickly told, but not so easy is it to tell the story behind the reduction, the thousands of economies adopted, the reductions in force, and finally the voluntary reduction in payrolls, by agreement between men and managements. This agreement resulted from a long series of negotiations between a committee of nine railway presidents, representing the carriers of the three districts, and the Railway Labor Executives' Association, comprising twenty labor groups. The agreement applied both to the railways, the Pullman Company, and the Railway Express Agency, Inc.

Under the agreement, which became effective on February 1, and was to remain in effect for one year, the carriers agreed to withdraw formal notices previously served on the men for a fifteen per cent wage reduction, and to make earnest efforts to maintain and increase railroad employment. The men agreed "that ten per cent shall be deducted from each pay check" of each of the employees covered by the agreement during the year ending January 31, 1933. The agreement further specifically provided that basic rates of pay should remain unchanged. Use of the word "deduction" rather than "reduction" in the agreement, and the provision as to basic rates, show the intent not to disturb the wage schedules, but to set up an arrangement that would temporarily help the financial situation.

That it did help is unquestioned, although the further declines in traffic and revenue that occurred during 1932 made it impracticable to maintain railway employment at their previous levels. The payroll saving from the ten per cent deductions, during the eleven months from February to December, 1932, cannot be computed with exactness, but newspaper estimates of the saving were generally much too high.

Late in 1932, this agreement was renewed along similar lines for another period of nine months, beginning with February and ending with October, 1933. This renewed agreement further specified that neither men nor managements would make any move toward changes in basic rates of pay prior to June 15, 1933.

Financial Assistance

Financial assistance came to individual railways from two definite sources in 1932, outside of the usual channels of financing. While the aggregate amount of out-

standing loans and bills payable, consisting principally of short-term loans from banks, showed a net increase of about fifty millions during the year, assistance to railways needing help came in largest measure from the Reconstruction Finance Corporation, and to a lesser degree from the Railroad Credit Corporation.

The Reconstruction Finance Corporation Act, effective on January 22, 1932, provided, in part, for loans out of government funds "to aid in the temporary financing of railroads and railways engaged in interstate commerce, to railroads and railways in process of construction, and to receivers of such railroads and railways." Applications for loans must receive the prior approval of the Interstate Commerce Commission before they can be considered by the Reconstruction Finance Corporation itself.

To the close of the year 1932, 104 loans aggregating $337,435,093 had been authorized to 62 railroads. Of this sum, $264,740 had been cancelled or withdrawn, and $52,859,081.52 still remained at the disposal of borrowers. A total of $284,311,271.48 had been disbursed to the railways, of which $11,839,562.71 was repaid during the year. Thus the net amount owed by the railways to the Corporation as of December 31, 1931, exclusive of interest accruals, was $272,471,708.77.

The proceeds of loans authorized to railroads were designed to be used for the following purposes:

For completion of new construction	$47,945,483
To pay principle of maturing equipment trust notes	21,114,713
To retire maturing bonds and other funded obligations	81,609,618
To pay loans from banks	37,793,900
To pay other loans	16,162,665
To pay interest on funded debt	73,960,423
To pay taxes	19,624,815
To pay past due vouchers for wages, materials, etc.	20,188,009
For construction and repair of equipment, etc.	13,550,000
Miscellaneous	5,485,467
Total	$337,435,093

These items, other than those included under "Miscellaneous," can be grouped under four principal headings, as follows:

New construction	$47,945,483
Refinancing (bonds, notes, bank and other loans)	156,680,896
Interest, taxes, wages, materials, etc.	113,773,247
Equipment repairs, etc. ("work loans")	13,550,000

The first two groups, new construction and refinancing, would call for financing, even in normal times. These groups aggregate $204,626,379 of the total, or about 60 per cent. The total of $113,773,247 borrowed for payment of interest, taxes, wages, and material bills, represented a provision for current obligations, normally met from current income. The railways may find it difficu't, if not impossible, to refinance these obligations in the future by selling stocks or bonds with which to repay the Reconstruction Finance Corporation.

The so-called "work loans" fall partly into the capital and partly into the current expense group, according to whether the proceeds of the loans are expended for construction or repair of equipment. These work loans, which were designed to encourage the employment of more men and thus provide them with work, carry a 5 per cent interest rate; all the other loans bear 6 per cent, temporarily reduced to 5½ per cent as of January 1, 1933.

The loans obtained by the railways from the Reconstruction Finance Corporation in 1932 aided the carriers in meeting many pressing problems of the moment. However, the benefits derived are, and can only be, of a temporary nature. Such relief cannot continue indefinitely, and in any case merely delays the date when the financial deficits of 1932 must in some way be made up.

The Interstate Commerce Commission's supplemental decision in the Fifteen Per Cent Case, 1931, which granted temporary and fractional increases (effective January 4, 1932) in certain specified rates, stipulated that the roads were relied upon to apply the funds to be derived from the authorized increases in rates in aid of financially weak railroads in accordance with the purposes expressed in our original report.

This reference was to a plan of the carriers, known as the "Marshalling and Distribution Plan, 1931," according to which they organized the Railroad Credit Corporation. Briefly, the plan provided that the carriers turn over to the Corporation within 50 days after the close of each month the amount of "emergency" revenues received from the increases in the several rates. Funds thus obtained by the Railroad Credit Corporation were to be loaned to individual roads to prevent, if possible, defaults in payment of interest. Eventually, the Corporation will be liquidated, as the loans are repaid and the funds returned to the carriers from which originally received.

The Commission estimated that the increase in rates granted by them would produce between one-hundred and one-hundred-and twenty-five million dollars. Owing largely to the declines in traffic in 1932, actual receipts from the so-called emergency rates fell short of that estimate. In part, too, the smaller revenue than was anticipated was due to delays in putting the increases into effect on intrastate traffic in various states. Despite supplemental orders by the Commission, the increases did not become effective at all in some states, so far as the intrastate traffic was concerned.

The Corporation reported, as of December 31, 1932, that it had received emergency revenues to a total of $52,201,092. This amount, however, does not include revenues earned in 1932 but not as yet reported to the Corporation. It is estimated that complete returns for the year 1932 will approximate $60,000,000.

As to loans by the Railroad Credit Corporation to participating carriers, 57 railroads applied during 1932 for loans, aggregating $105,990,446. Loans totaling $48,324,919 were approved, a total of $55,364,408 was removed from the docket, and a total of $2,301,119 was pending at the close of the year.

In the latter part of 1932 the railway executives filed a petition for the continuance of the emergency rates beyond March 31, 1933, when the original order expires. The railway case was presented at a hearing before the Commission on December 28, and further hearings were set for February, 1933. The railways asked that the condition be eliminated under which revenues derived from the emergency rates are turned over to the Railroad Credit Corporation and that each railway be permitted to retain all such revenues earned by it.

Improvement in Traffic

For a time during the early autumn of 1932 freight traffic showed a steady and slightly better than seasonal improvement. This followed the week ended August 6, when carloading dropped to a seasonally low total of 496,033 cars. The Commission's report for 1932 commented as follows on this trend: "This fall there was an upturn in traffic which furnishes better reason for believing that the bottom of the decline has been reached than existed for the similar hope which was entertained last year."

Over a period of nine weeks succeeding August 6, exclusive of the Labor Day holiday week, carloadings rose slowly but steadily week by week, reaching a total of 650,578 cars during the week of October 15, and declined gradually to the end of the year. The effect of this rise may be seen by a glance at Charts *A* and *B*,

which will be discussed shortly. The operating revenues (Chart *C*) also reflect the improvement from August to October. Unfortunately, the improvement halted in November and December, and the freight movement fell back to a level relatively higher than in June and July, but not so much higher as had been anticipated when the rise set in during August.

This temporary improvement in freight traffic, while disappointing as to any far-reaching effects, did help the financial position of the railways while it lasted, and gave encouragement that when a more sustained improvement does set in, whether in 1933 or later, the net income of the railways will respond to a marked degree.

Understanding of Railway Problem

In our review for 1931, we said: "Another gain was the growth of a clearer understanding of the railway situation in 1931 by the public than for some time in the past. . . . With increasing public concern over the railway industry's financial situation, it seems clear that foundations have been laid for a broader approach to its problems in the future."

The Interstate Commerce Commission expressed the same idea in its annual report for 1932, when it said: "More or less aimless concern over the future of the railroads is rapidly being replaced by intensive study directed towards ways and means of improving the situation."

Many examples could be given of this increasing public interest in, and keener appreciation of, the transportation problem of the United States, in all of its varied aspects. The Commission's report mentioned three in particular: The National Transportation Committee; associations of shippers, business men, and railroad labor; the railways themselves. These may be briefly outlined as follows:

The National Transportation Committee was created in the autumn of 1932, under the sponsorship of groups of fiduciary institutions interested in the integrity of railway securities, to make a comprehensive and judicial study of the transportation problem as a whole. The Committee organized under the chairmanship of former President Calvin Coolidge, and with an ample technical staff assisting it. Conferences were held in December with railway and other industrial groups and interests, designed to develop all possible facts and points of view. The sudden death of Mr. Coolidge in the midst of this activity was a tragic blow, but the study is being continued to completion by his associates on the Committee, Messrs. B. M. Baruch, Alfred E. Smith, Alexander Legge, and Clark Howell, and their findings will become available early in 1933. As the Commission said in its report: "The results of this study, which is under most capable direction, are bound to be of value."

Many business groups also took an active interest in the transportation problem in 1932. Some of them appeared before the National Transportation Committee, in the course of its conferences. Not the least of these interests were the Shippers' Advisory Boards, which during the year broadened their activities beyond that of considering the efficiency of railway service, and stood ready to assist in the working out of the complex problem of transportation. Congress took a hand, and through a special committee of the House of Representatives made an exhaustive inquiry of the extent to which the government was competing with transportation agencies, on the Mississippi river and elsewhere. The widespread response of the public to the special number issued by the *Railway Age* on December 3, which carried a comprehensive survey of the railway problem and its solution, and in which many industrial agencies participated, indicated a keen interest in that subject on the part of business executives, public officials, and others.

The railways presented to the National Transportation Committee, in December, not only an extensive survey of the achievements and difficulties of the railways, but also a specific set of recommendations as to policy. In brief, these recommendations dealt with the need on the one hand for less restricted regulation of the railways, together with greater power to enter other fields of transportation activity; on the other hand, for definite regulatory measures to be applied to water and motor vehicle transportation of the different types, both intrastate and interstate. The recommendations struck a keynote in the following words: "It is believed that railroad transportation is and always will be essential to the public welfare. It should, in the public interest, be given equality of opportunity with all other instrumentalities that serve the public in this (the transportation) field."

Competition

Competition of unregulated agencies of transportation with regulated rail services continued unabated during 1932. The Interstate Commerce Commission issued its report on co-ordination of motor vehicle transportation in April, in which the increasing competition of commercial motor vehicles on the highways with the railways was definitely stated.

While the principal cause of the financial difficulties of the railways in 1932 was the decline in traffic and revenue growing out of the economic situation, the Commission in its annual report for 1932 listed competition from motor vehicle and water transportation as secondary causes, which in its opinion demand and should receive immediate attention.

The Commission in this report recommended the consideration of regulation of port-to-port rates of water carriers, and repeated the recommendations previously made in its April report on motor vehicle transportation. After finding that competition is conducted under conditions of inequality, the Commission concluded that legislation regulating motor vehicles engaged in interstate commerce is desirable in the public interests. It recommended the immediate enactment by Congress of regulation of interstate motor bus operations, also of a measure of authority over motor trucks, designed to locate those operating in interstate commerce and obtain certain operating statistics from them. These recommendations, the Commission added, "do not cover the utmost which we believe will ultimately prove necessary and desirable in the way of Federal regulation of motor vehicles. They represent merely the first step which we believe it is wise and practicable to take under existing conditions."

Meanwhile, state regulation and taxation of commercial motor vehicles continues to develop, although such regulation can only indirectly affect interstate operations. There is a crying need for interstate regulation of the motor vehicle, which Congress has thus far ignored. The right of individual states to exercise police powers over commerce on its highways, even though interstate in character, was upheld by the Supreme Court on several occasions during 1932, notably in cases involving the constitutionality of acts passed by the states of Texas and Kansas.

Other General Developments

Consolidation took a forward step in 1932, through agreement by the Interstate Commerce Commission and the several Eastern railways (excluding New England) on a modified four-system plan. Two consolidation pro-

posals in Southwestern territory also came before the Commission for approval during the year, but were still pending in December.

The Commission again renewed its recommendation to Congress for repeal of the recapture provisions of the Transportation Act, but without result.

Various general rate hearings and investigations were conducted by the Commission in 1932, among others its Six-Hour Investigation, which is described later in this review.

Principal Operating Factors in 1932

The operating and statistical features of railway operations in 1932 are summarized below:

1. Freight traffic declined about 24 per cent below 1931 and about 47 per cent below 1929. The cumulative declines of 1930, 1931 and 1932 brought the freight level of 1932 down to that of years prior to 1910.
2. Passenger traffic fell 23 per cent below 1931, and 45.9 per cent below 1929. Total passenger-miles in 1932 were less in number than in any year since 1900.
3. Operating revenues declined 25.4 per cent under 1931 and 50.3 per cent under 1929. The aggregate for 1932 was less than in any year since 1915.
4. Operating expenses were reduced 25.6 per cent below 1931, were lower than in 1929 by 46.7 per cent, and were less than in any year since 1916.
5. The operating ratio averaged 76.9 per cent in 1932, fractionally lower than the operating ratio of 77.1 in 1931.
6. Net railway operating income aggregated $330,000,000, a decline of $201,000,000 under 1931 and $944,000,000 under 1929. The decline from 1929 to 1932 was 74 per cent.
7. Rate of return earned on property investment was 1.23 per cent. The corresponding rate in 1931 was 1.98 per cent, and 4.84 per cent in 1929.
8. The index of railway efficiency declined for the second consecutive year, but stood at a higher point than in any year from 1920 to 1926, inclusive.
9. Freight train speed was the only factor of railway performance to make a new record during the year 1932.

Traffic

Table I summarizes railway traffic in the years 1929 to 1932, compared with the five-year average, 1925 to 1929. Freight traffic is stated in terms of both revenue carloading and revenue ton-miles, while passenger traffic is in terms of passenger-miles.

Table I—Comparative Traffic Statistics

Revenue Carloadings	
1932	28,195,000
1931	37,151,000
1930	45,717,000
1929	52,828,000
Five-year average, 1925-29	52,075,000
Revenue Ton-Miles	
1932	233,500,000,000
1931	309,225,000,000
1930	383,450,000,000
1929	447,322,000,000
Five-year average, 1925-29	433,307,000,000
Passenger-Miles	
1932	16,800,000,000
1931	21,899,000,000
1930	26,824,000,000
1929	31,079,000,000
Five-year average, 1925-29	33,562,000,000

The statistics of Table I and succeeding tables relate to railways in Class I. In the case of revenue and expenses, large switching and terminal companies are included. Except as to carloadings, where the statistics are final for the year, all the statistics included for 1932 are preliminary, and are subject to slight revisions.

Freight traffic measured by carloadings in 1932 fell 24.1 per cent below 1931, 46.6 per cent below 1929, and 45.9 per cent below the five-year average. Freight traffic measured in revenue ton-miles showed similar declines. The annual average of railway freight traffic during the years from 1925 to 1929 was greater than in any five-year period in rail history.

Railway freight traffic reached its peak in the period from 1926 to 1929, and the percentages of decline to 1932 were all the more significant of the effect of the current economic situation on railway business.

Passenger-miles in 1932 were 23.3 per cent less in number than in 1931, fell 45.9 per cent below 1929, and 49.9 per cent below the five-year average. Railway passenger traffic reached its peak in 1920, and has declined almost continuously since that year.

Carloadings

Revenue loadings of freight in 1932 aggregated 28,195,000 cars, which was the smallest traffic reported in any year of the fifteen-year period during which these statistics have been collected. The peak of the year 1932 was reached in the week ending October 15, with total loadings of 650,578 cars. The annual peaks for the seven years from 1926 to 1932 were as follows, and emphasize the progressive declines since 1929:

Maximum Week	Carloadings
1926 (Oct. 26)	1,208,878
1927 (Oct. 19)	1,129,055
1928 (Sept. 29)	1,196,965
1929 (Sept. 28)	1,203,139
1930 (Aug. 30)	984,510
1931 (Oct. 3)	777,712
1932 (Oct. 15)	650,578

The peak reached in 1926 was the all-time record for a single week's loadings; the peak for 1932 was slightly more than one-half of the 1926 maximum.

Revenue Ton-Miles

Turning to the revenue ton-mile as a measure of traffic, the freight movement of 1932 amounted to 233,500,000,000 ton-miles, a decrease of 24.5 per cent under 1931, 47.8 per cent under 1929, and 46.1 per cent under the five-year average.

Similar trends occurred in all of the three districts. Ton-miles declined 22.9 per cent under 1931 in the Eastern District, 25.6 per cent in the Southern Region, and 26.4 per cent in the Western District. Compared with 1929, the decreases were 46.7 per cent in the East, 49.2 per cent in the South, and 49.2 per cent in the West.

Chart *A* shows the trend in revenue ton-miles, by months, for the years 1929 to 1932. The progressive decline year by year is marked. The chart also indicates the temporary improvement from August to October, which has already been discused.

Freight Traffic Trend

Longtime trends are often measured on the basis of "moving averages." For example, we may take successive periods of three months each, and pass from one period to the next by dropping the first month, and adding a month at the other end. The use of three months as a basis smooths out the comparative curve.

Table II gives the comparative trend in carloadings during the years 1931 and 1932, the percentages being the decrease of each successive three-month period under the corresponding average period of the five years from 1925 to 1929.

Carloadings in the first three-month period, ending with January, 1931, declined 21.9 per cent under the

five-year average. This decline grew steadily during each successive period to the middle of 1932, reaching a maximum decrease of 51.7 per cent in the months of

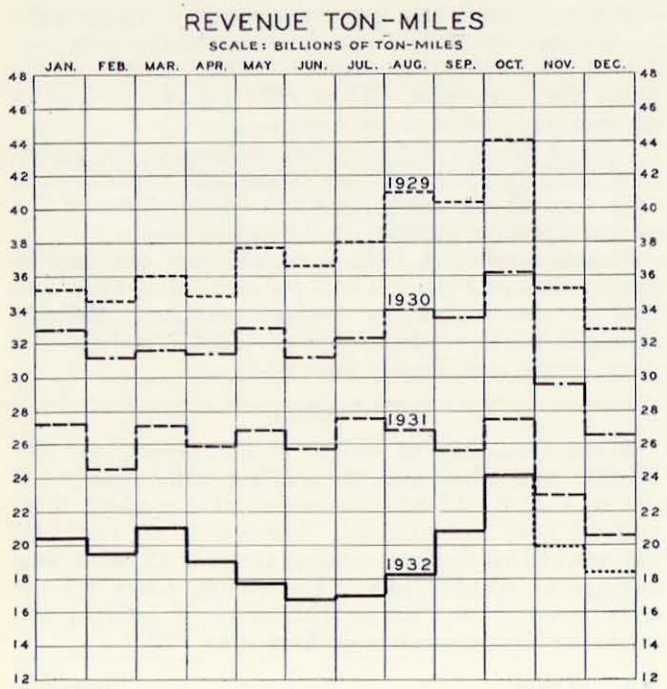


Chart A

June to August. The decline then began to moderate, and had fallen to 45.1 per cent in the final quarter of 1932.

Chart *B* is based on the figures of Table II, but has been extended back to 1929, so as to contrast that year and the years 1930, 1931 and 1932. It covers a period of four years, showing the trend from the beginning of 1929 to the close of 1932. The curve ran generally upward to July, 1929, then turned downward, declined in practically every subsequent period to the middle of the year 1932. The curve turned again upward after July, indicating that the seasonal improvement that took place in the autumn of 1932 was somewhat better than normal. To what extent this improvement will continue in 1933, or to what extent the percentage declines of the last quarter of 1932 will be held without another

Table II—Decreased Carloadings Measured by Three-Month Periods

(Compared with similar period, 1925-1929)

Period	Per cent decrease
Nov.-Jan. (1931)	21.9
Dec.-Feb.	22.1
Jan.-Mar.	22.4
Feb.-Apr.	22.7
Mar.-May	24.0
Apr.-June	24.6
May-July	26.6
June-Aug.	27.6
July-Sept.	30.4
Aug.-Oct.	33.1
Sept.-Nov.	34.8
Oct.-Dec.	35.5
Nov.-Jan. (1932)	36.7
Dec.-Feb.	37.6
Jan.-Mar.	39.0
Feb.-Apr.	40.8
Mar.-May	43.8
Apr.-June	47.0
May-July	50.7
June-Aug.	51.7
July-Sept.	51.1
Aug.-Oct.	48.5
Sept.-Nov.	47.0
Oct.-Dec.	45.1

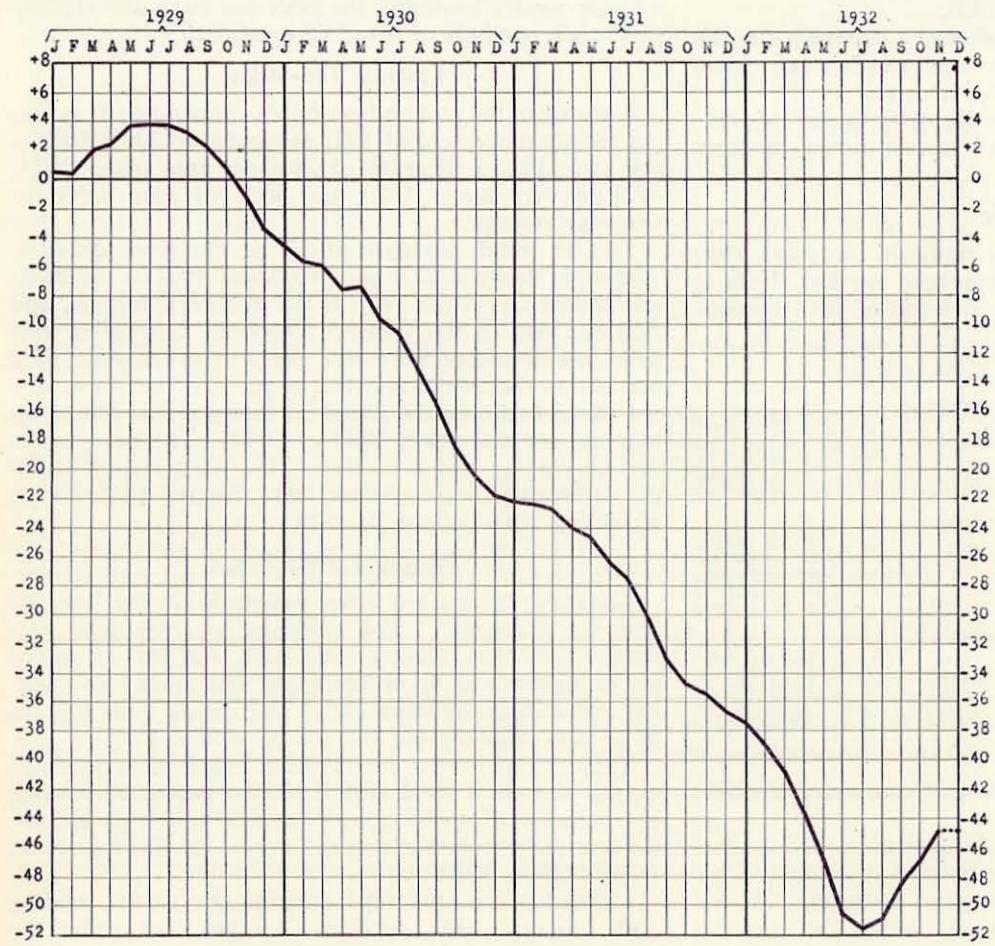


Chart B: Moving Average of Carloadings, 1929-1932—Per Cent of Increase or Decrease Over Corresponding Period of Five-Year Average, 1925 to 1929, Based on Middle Month of Successive Three-Month Periods

downward dip, only the weekly reports as they come in through the coming year will disclose.

Loadings by Commodity Groups

Table III distributes the revenue carloadings of 1932 among the eight principal commodity groups of the Car Service Division's classification. The number of cars in each group is shown for 1932, together with a percentage distribution of total among the several groups for both 1932 and 1931. There is also a column giving the percentage decline of each group from 1931 to 1932.

Table III—Distribution of Carloadings in 1932, By Groups

	Number (000)	Percent decline 1932 under 1931	Percent distribution 1932	Percent distribution 1931
Grain and products	1,653	18.3	5.9	5.4
Live stock	949	18.3	3.4	3.1
Coal	5,339	17.8	18.9	17.5
Coke	224	31.1	0.8	0.9
Forest products	900	38.9	3.2	4.0
Ore	211	75.9	0.7	2.4
Merchandise, L. C. L.	9,079	17.1	32.2	29.4
Miscellaneous	9,840	29.0	34.9	37.3
Total	28,195	24.1	100.0	100.0

The eight commodity groups declined without exception in 1932, the percentage of decrease ranging from a minimum of 17.1 per cent for merchandise (l.c.l.) to a maximum of 75.9 per cent for ore. Grain and grain products, live stock, coal, and merchandise loadings declined at a somewhat lesser rate in 1932 than did carloadings as a whole. The same was true of these four groups in 1931 and 1930. The other four groups —coke, forest products, ore, and miscellaneous—fell off in 1932, as they also did in 1931 and 1930, at a rate greater than the rate of decline in all-commodity loadings.

Financial Results in 1932

Table IV summarizes the railway operating income account for the years 1932, 1931, and 1929.

Total operating revenues amounted to $3,160,000,000 in 1932, the smallest annual total since the year 1915.

Table IV—Condensed Income Account

	1932 (millions)	1931 (millions)	1929 (millions)
Total operating revenues	$3,160	$4,237	$6,360
Total operating expenses	2,430	3,266	4,561
Taxes	280	308	403
Net railway operating income	330	531	1,274
Operating ratio	76.9%	77.1%	71.7%

The decrease under 1931 was $1,077,000,000, or 25.4 per cent, while the decline under 1929 was $3,200,000,000, or 50.3 per cent. In other words, operating revenues were more than cut in half during the brief span of three years between 1929 and 1932.

Operating expenses in 1932 totaled $2,430,000,000. This was a reduction of $836,000,000, or 25.6 per cent under 1931. The reduction below 1929 was $2,131,000,000, or 46.7 per cent.

The operating ratio in 1932 was 76.9 per cent, fractionally lower than the operating ratio of 77.1 in 1931, but considerably higher than the ratio of 71.7 per cent for 1929.

Net railway operating income, after operating expenses, taxes, equipment and joint facility rentals, amounted to $330,000,000 in 1932. This was a decline of 37.9 per cent under 1931, and 74.1 per cent, or nearly three-fourths, under 1929.

Every aggregate in Table IV showed a progressive decline from 1929 to 1932, but by far the greatest relative decrease took place in net railway operating income.

Taxes

Railway tax accruals aggregated $280,000,000 in 1932. This was a decrease of 9.1 per cent under 1931, and 30.5 per cent under 1929. These declines in railway taxes have been the result of the lower gross revenues and net income of the railways, which are the basis on which many federal and state corporation taxes are calculated. General property taxes assessed on the railways, on the other hand, seem to continue as great as, or greater than, in the years of relative prosperity.

The ratio of railway taxes to railway revenues was 8.9 per cent in 1932, compared with 7.3 per cent in 1931, and 6.3 per cent in 1929. That is, 8.9 cents of every dollar of railway revenues in 1932 was absorbed by federal, state and local taxes. This measures the burden of taxes more accurately than do the figures of gross amounts paid out in taxes. On this basis, the railway tax burden in 1932 was heavier than in any other year in rail history.

The rising trend in the tax ratio from 1922 to 1932 is shown by the following table. The ratio increased from 5.4 cents of taxes per dollar of revenue in 1922 to 8.9 cents per dollar of revenue in 1932, or 65 per cent. The increase in the ratio in one year from 1931 to 1932, was 21.9 per cent, and from 1929 to 1932 was 41.3 per cent.

Railway Taxes

	(cents per dollar of revenue)
1932	8.9
1931	7.3
1930	6.6
1929	6.3
1928	6.4
1927	6.1
1926	6.1
1925	5.9
1924	5.8
1923	5.3
1922	5.4

Rate of Return

Table V is a comparative statement of rate of return on railway property investment, for each year from 1922 to 1932. Because statistics are as yet incomplete regarding the amount of railway investment at the end of 1932, the rate of return is computed for that year (also for 1931, in order to supply a comparative basis for the two years) on the basis of the investment at the beginning of the year, whereas for the other years in the table the rate is computed on the end-of-the-year investment, which is the method followed by the Interstate Commerce Commission.

Table V—Rate of Return on Property Investment

(Including Material, Supplies, and Cash)

Computed on investment at beginning of year:	
1932	1.23%
1931	1.98
Computed on investment at end of year:	
1931	1.99
1930	3.30
1929	4.84
1928	4.64
1927	4.29
1926	4.98
1925	4.74
1924	4.21
1923	4.33
1922	3.58

The rate of return for 1932 computed as just described was 1.23 per cent, which reduced to a relative basis was 38 per cent below the 1.98 per cent earned in 1931, and was less than one-fourth as great as in 1929. Corresponding rates of return for the three districts in 1932 were as follows: Eastern District, 1.72 per cent;

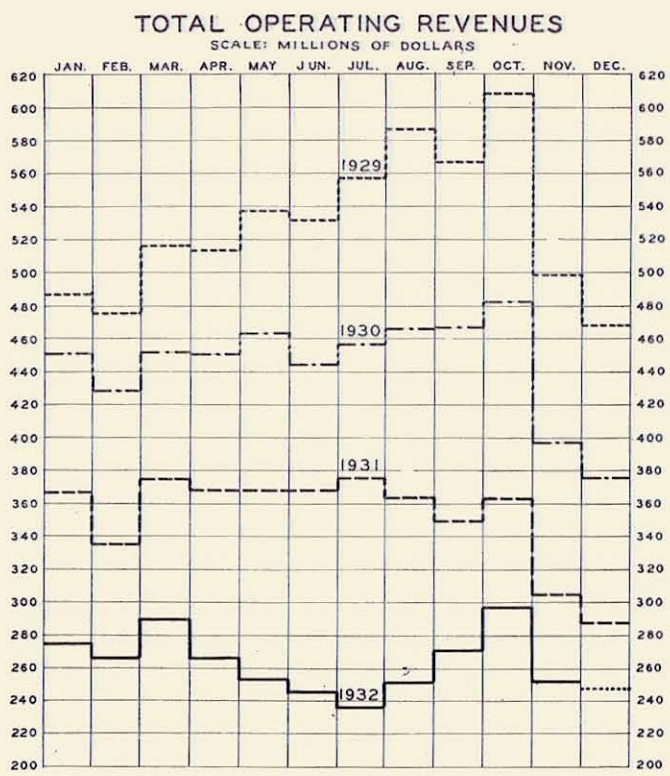


Chart C

Southern Region, 0.67 per cent; Western District, 0.77 per cent.

The rate of return for the year 1932, 1.23 per cent, was lower than in any of the ten years from 1922 to 1931, inclusive. It was less than one-third of the average annual rate of return earned during that ten-year period.

Railway Operating Revenues

Table VI summarizes the principal items of railway operating revenue in 1932, compared with 1931 and with 1929.

Not only did operating revenues as a whole decline from 1929 to 1932, but the same was true of each of the principal revenue groups.

Table VI—Railway Operating Revenues

	1932 (millions)	1931 (millions)	1929 (millions)
Freight revenue	$2,452	$3,257	$4.832
Passenger revenue	376	551	874
Mail revenue	95	105	152
Express revenue	54	83	148
All other	183	241	354
Total	$3,160	$4,237	$6,360

Comparing 1932 with 1931, freight revenue declined $805,000,000 or 24.7 per cent. The cumulative decrease in freight revenue from 1929 to 1932 was $2,380,000,000, or 49.3 per cent.

Passenger revenue declined by $175,000,000 in 1932, or 31.8 per cent. The decline under 1929 was $498,000,000, or 57 per cent.

Mail revenue fell off to a lesser extent than any other revenue group, the decline under 1931 being $10,000,000, or 9.5 per cent. Back mail pay of about $38,000,000 was received by the railways from the government in 1929. Deducting that amount from the total for 1929, and making the comparison with 1932 on that adjusted basis, the decline from 1929 to 1932 in mail revenue was 16.7 per cent.

Express revenue decreased 34.9 per cent in 1932, compared with 1931, and 63.5 per cent compared with 1929.

Chart *C* well indicates the drop in rail revenues in the autumn of 1929, the declines of 1930 and 1931, and the temporary increase from August to October, 1932.

Railway Operating Expenses

Table VII summarizes the operating expenses in 1932, by principal accounts, and compares them with 1931 and 1929.

All of the general expense accounts showed trends similar to those for operating expenses as a whole. That is, they were reduced progressively from 1929 to 1932.

Table VII—Operating Expenses

	1932 (millions)	1931 (millions)	1929 (millions)
Maintenance of way	$355	$536	$865
Maintenance of equipment	629	829	1,212
Traffic	96	118	131
Transportation	1,170	1,565	2,113
General and other	180	218	240
Total	$2,430	$3,266	$4,561

The largest single account, transportation expenses, was reduced $395,000,000 under 1931, or 25.2 per cent. The decline from 1929 to 1932 amounted to $943,000,000, or 44.6 per cent.

Maintenance expenses in 1932—way and equipment combined—were reduced by $381,000,000, or 27.9 per cent. The decline from 1929 to 1932 aggregated $1,093,000,000, or 52.6 per cent.

The railways made strenuous efforts during the three years 1930 to 1932 to reduce operating expenses down, in line with the rapid decline in their revenues. How they succeeded is indicated by these figures of operating expense. Complete success in 1932 was not practicable, because many expenditures must be made regardless of the amount of traffic handled and revenue earned. But drastic economies were found possible in 1932 and were made.

Chart *D* tells the story of operating economies from 1929 to 1932, by months.

Revenue per Traffic Unit

Table VIII shows what revenue was received by railways of Class I for the average ton-mile of freight, and the average passenger-mile, for each year from 1921 to 1932. This is the complete period of years since the general rate increase authorized by the Interstate Commerce Commission in 1920 became effective.

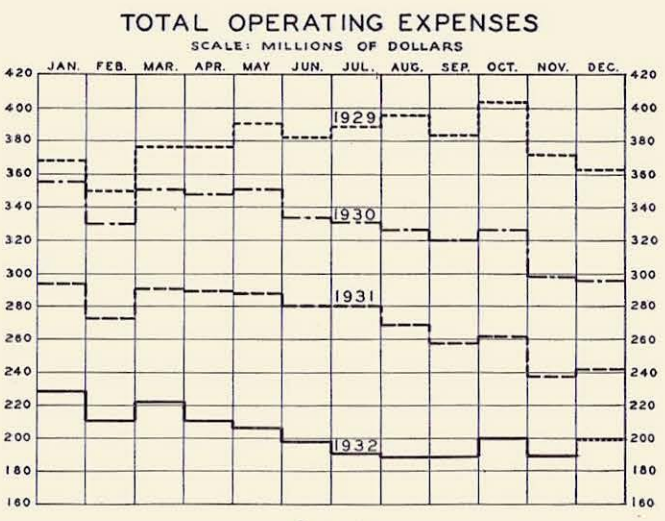


Chart D

Freight revenue per ton-mile has declined almost steadily from 1.275 cents in 1921 to 1.050 cents in 1932. The decline for the whole period of eleven years was 17.6 per cent. Average revenue per ton-mile depends on a number of factors, such as character of traffic, length of haul, and readjustments in basic freight rates. General rate readjustments play an important part, as is evident from the fact that the Commission's rate decision of 1922, readjusting all freight rates downward by ten per cent, accounts for more than half the total decline of 17.6 per cent between 1921 and 1932.

Average passenger revenue per passenger-mile has also declined, dropping from 3.086 cents in 1921 to 2.220 cents in 1932. The relative decline was 28.1 per cent for the eleven years from 1921 to 1932, and 11.7 per cent during the one year between 1931 and 1932. These declines have been due largely to the relative stability of commutation passenger traffic, in the face of declining longer-haul travel, and to special rates offered by the carriers to stimulate passenger traffic.

Table VIII—Average Revenue per Ton-Mile and Passenger-Mile 1921-1932

Year	Revenue per ton-mile (cents)	Revenue per passenger-mile (cents)
1932	1.050	2.220
1931	1.051	2.513
1930	1.063	2.717
1929	1.076	2.808
1928	1.081	2.850
1927	1.080	2.896
1926	1.081	2.936
1925	1.097	2.938
1924	1.116	2.978
1923	1.116	3.018
1922	1.177	3.027
1921	1.275	3.086

Gross Capital Expenditures

Table IX summarizes the gross capital expenditures of railways of Class I, for each year from 1923 to 1932. The railways' program for increased efficiency of operation, and for improvement of their plant, became effective in 1923, and capital expenditures in that year were greater than for any of the ten years included in the table.

Gross capital expenditures for 1932, without allowance for retirements or abandonments, aggregated not more than $200,000,000. This total was smaller than in any of the ten years included in the table, and was much below the annual average of $730,363,000 expended during the ten-year period.

Table IX—Gross Capital Expenditures

1932	$200,000,000
1931	361,912,000
1930	872,608,000
1929	853,721,000
1928	676,665,000
1927	771,552,000
1926	885,086,000
1925	748,191,000
1924	874,744,000
1923	1,059,149,000
Total—ten years	$7,303,628,000

Equipment Installations

Monthly reports with respect to new units of equipment placed in service are summarized in Table X. The number of each class on order at the close of the year is also stated. These statistics exclude any units that may be leased by railway companies to other railway companies. The table compares the year 1932 with 1931 and 1929.

The decline in gross capital expenditures in 1932 is reflected in Table X. Only 37 locomotives and less than 3,000 freight cars were placed in service during the year, and the number on order at the close of the year were also much below normal. In the case of freight cars, the decline in the number on order was relatively smaller than in the number installed, indicating greater activity in car buying toward the end of the year.

Table X—New Equipment Installations

	Installed during year	On order Dec. 31
Locomotives:		
1932	37	3
1931	124	39
1929	762	431
Freight cars:		
1932	2,968	2,431
1931	12,662	4,042
1929	84,894	34,581
Passenger cars:		
1932 (as of Sept. 30)	151	47
1931	528	15
1929	2,598	410

Railway Employees

The number of railway employees showed a further decline in 1932, although the decrease in number of men was relatively smaller than the declines in traffic, in revenues, and in operating expenses.

The average number of men and women on railway payrolls during the year approximated 1,030,000, compared with 1,261,000 in 1931, a decrease of 18.3 per cent. Aggregate compensation to employees fell from $2,095,000,000 in 1931 to $1,500,000,000 in 1932, or 28.4 per cent.

Average employee earnings in 1931 and 1932 were affected by the many changes in force and in working hours made during those two years. The agreement for a ten per cent deduction from pay checks, which became effective on February 1 and continued through the balance of the year, was also a factor. Bearing this in mind, annual earnings per employee averaged $1,456 for 1932, compared with $1,662 for 1931 and $1,742 in 1929.

Hourly compensation per employee averaged 63.0 cents in 1932, compared with 68.9 cents per hour in 1931, and 66.6 cents per hour in 1929. The decline was 8.6 per cent from 1931 to 1932, and 5.4 per cent from 1929 to 1932.

The Interstate Commerce Commission was directed by Congress in 1932 to investigate what effect on railway expenses and service the inauguration of a six-hour day in railway operations would have. After lengthy hearings, the Commission submitted its report in December.

The Commission found that such a fundamental change in working conditions would not materially affect rail operations or service, providing that revenues earned would be sufficient to meet the greatly added costs. These costs, assuming no reduction in the rate of pay for a six-hour day as compared with the present eight-hour day, would have added $630,000,000 to rail operating expenses in 1930, and $414,000,000 to rail expenses during the twelve months ended September 30, 1932.

Railway Operating Efficiency

The index of operating efficiency declined in both 1931 and 1932, due in part to the fact that with a lower level of traffic the railways were unable to maintain their previous averages as to carloads and train loads. Furthermore, the need for drastic economy forced them to

permit an increase in the number and percentage of equipment units in bad order.

Our general index of operating efficiency contains eleven factors of operation. These are combined in nine separate indices, as follows, two factors each being included in Items 2 and 8. This same basis was followed in 1931.

1. Gross ton-miles per freight train-hour (excl. L. & T.)
2. Percentage serviceable freight and passenger locomotives.
3. Percentage serviceable freight cars.
4. Freight train speed.
5. Gross ton-miles (excl. L. & T.) per ton of fuel.
6. Passenger train car-miles per car day.
7. Freight car-miles per active car day.
8. Locomotive-miles per active locomotive-day (freight and passenger).
9. Net tons per freight train.

Table XI is a composite index of railway operating efficiency, calculated on the basis of factors just named, for the years 1922 to 1932. Each of the nine factors is given equal weight in the index. The table commences with 1922, because that year immediately preceded the adoption of the railways' program of increased efficiency and economy in the spring of 1923. This index utilizes the annual average for the five years from 1920 to 1924, inclusive, as the base period, or 100 per cent.

The efficiency index rose steadily from 1922 to 1930, then showed a decline in 1931 and again in 1932. This drop, as already indicated, is explained by the necessity for rigid economy and by the depressed traffic situation.

Table XI—Index of Rail Efficiency

(1920-1924 = 100)

1932 (11 months)	115.8
1931	121.8
1930	123.4
1929	122.3
1928	120.2
1927	116.7
1926	113.8
1925	110.5
1924	105.9
1923	101.6
1922	97.6

Reserve Equipment

The great reduction in traffic in 1932, as in 1931 and 1930, affected the amount of equipment held out of service, or in reserve, and led to further unprecedented increases in those reserves. They are measured by the number of stored locomotives and by the number of surplus or idle freight cars, both of which reached peak levels throughout the greater portion of the year 1932.

Stored serviceable locomotives averaged 10,659 in 1932 as against 9,728 for the year 1931, and 5,302 for 1929.

The daily freight car surplus averaged 694,022 serviceable cars in 1932, compared with annual averages of 611,853 for the year 1931 and 233,956 for 1929. These figures do not include privately owned or special service cars. There was, of course, no car shortage in 1932, as there were no shortages in 1930 and 1931.

Physical Condition of Equipment

The proportion of freight and passenger locomotives, and of freight cars, in serviceable condition declined in 1932. Locomotives in good order averaged 83.7 per cent in 1929, 79.4 per cent in 1931, and 74.1 per cent during the first eleven months of 1932. Freight cars in good order averaged 94.0 per cent in 1929, 92.1 per cent in 1931, and 89.5 per cent during the first eleven months of 1932.

These declines were made necessary by the necessity of reductions in maintenance expenditures. As the reserve equipment in 1932 was greater than ever before, considerable maintenance of equipment could be and was postponed to a later date.

Freight Train Speed

The average speed of freight trains between terminals has increased almost constantly since 1922, and attained a new record in 1932, as indicated in Table XII.

While the improvement in 1932 was probably due in part to lighter train loads, a part also resulted from improved methods of operation, reduction in delays while on the road, and greater power applied to the trains in motion, thus producing higher average speeds.

Table XII—Average Speed of Freight Trains

	Train speed (miles per hour)
1932 (11 months)	15.5
1931	14.8
1930	13.8
1929	13.2
1928	12.9
1927	12.3
1926	11.9
1925	11.8
1924	11.5
1923	10.9
1922	11.1

Freight Car Movement

Mileage per freight car per day is here computed on the basis of active cars, that is, cars other than those reported as surplus and therefore idle.

Surplus freight cars are not making mileage. The elimination of idle or surplus cars from calculations of average movement of cars measures the performance of freight cars in active service. The average movement per "active" (i.e., not idle or surplus) freight car per day during the first 11 months of 1932 was 28.2 miles, compared with 33.3 miles for the year 1931, and 36.1 miles for 1929.

Freight cars also lose time while being loaded or unloaded by shippers, whether in free time or not. They also lose time while awaiting repairs. This last factor had a considerable bearing on the decrease in miles per active car per day in 1932.

As freight train speed was higher in 1932 than in any previous year, and as a freight car travels at the same rate of speed as the train of which it is a part, freight cars while actually in motion were making excellent mileage. Average freight train speed during the first 11 months of 1932 was 15.5 miles per hour, or 372.0 miles per day. Any freight car in movement for a continuous period of 24 hours also averaged 372.0 miles.

Locomotive Movement

Mileage per active locomotive per day in 1932, like average freight car movement, also showed a decline. The number of locomotives in storage during the year 1932 was greater than in any previous year. Like the idle freight car, a stored locomotive makes no mileage, and when counted in the total number on which the average mileage of the average locomotive is computed, that average is bound to go down.

Reduced to an "active" basis, however, and excluding stored locomotives from the computation, the average movement for freight locomotives was 56.0 miles per day during the first 11 months of 1932, compared with 64.5 miles for the year 1931, and 74.1 miles per day for 1929. The average movement for "active" passenger locomotives was 113.8 miles per day during the first 11 months of 1932, 124.5 miles for the year 1931, and 134.8 miles per day in 1929.

Here, too, the increased number and percentage of locomotives awaiting repairs affected the lowered average movement in 1932.

Average Train and Car Load

Average freight train loading declined in 1932, compared with 1931 and 1929. The average was 664 tons during the first 11 months of 1932, compared with 733 tons for the year 1931, and 804 tons for 1929.

Average tons per loaded freight car also fell below the averages for 1929 and 1931. The loading for the first 11 months of 1932 was 24.8 tons, compared with 25.7 tons per car for the year 1931, and 26.9 tons per car in 1929.

The amount of the load in the freight car is governed to an appreciable extent by shipper practices, and to that degree is not an exact measure of railway performance. Train loads are more fully under railway control, qualified by the character of the traffic, its volume, and the average carload.

Net Ton-Miles per Car-Day

Net ton-miles per freight car per day in 1932 declined below the years 1931 and 1929. The daily average was 300 miles for the first 11 months of 1932, compared with 382 ton-miles per freight car per day for the year 1931, and 547 ton-miles in 1929.

The greatly reduced demand for freight service in 1931 and 1932, and the great increase in number of surplus cars, unquestionably affected the reduced daily performance of the average freight car.

Gross and Net Ton-Miles per Freight Train-Hour

The average of gross ton-miles per train-hour during the first 11 months of 1932, compared with the years 1929 and 1931, was as follows:

1932 (11 months)	26,163
1931	26,702
1929	24,539

The average number of net ton-miles per train-hour excludes the weight of the cars, and includes only the freight in the train. This average was as follows for 1932 (11 months) compared with 1931 and 1929:

1932 (11 months)	10,283
1931	10,816
1929	10,580

Fuel Conservation

Fuel consumption per 1,000 gross ton-miles in the freight service during the first 11 months of 1932 was 122 pounds, compared with 119 pounds per 1,000 G.T.M. for the year 1931 and 163 pounds in 1922. In the passenger service, fuel consumption per passenger train car mile during 1932 (eleven months) was 14.8 pounds, compared with 14.5 pounds in 1931 and 17.9 pounds in 1922. For the first time since 1923, these factors failed in 1932 to show improvement.

The details for each year from 1922 to 1932 are given in the following table:

	Locomotive fuel per 1,000 g.t.m. (inc. loco. and tender)	Loco. fuel per pass. train car mile
1932 (11 months)	122 lbs.	14.8
1931	119	14.5
1930	121	14.7
1929	125	14.9
1928	127	15.0
1927	131	15.4
1926	137	15.8
1925	140	16.1
1924	149	17.0
1923	161	18.1
1922	163	17.9

Safety of Operation

Railways over a considerable period have conducted an intensive safety campaign, which has borne fruitful results with respect to conservation of life and limb, of both passengers and employees.

This campaign continued in 1932, and while the favorable results attained were due in part to the smaller number of employees and passengers, compared with 1931, the reduction in casualties was none the less impressive.

Preliminary returns for the year indicate that not a single revenue passenger lost his life in a train accident during 1932. This is believed to be an all-time record in railway history. One man reported as a passenger met with a train-accident fatality, but he was an employee deadheading on a passenger train.

Basing the casualty trends for the year on the reported results for the first ten months of 1932, the decline under 1931 was as follows for the respective classes:

	Per cent decrease in Fatalities	Non-fatal injuries
Total nontrespassers	19.3	23.7
Passengers	36.8	12.4
Employees on duty	15.2	26.4
Others	20.3	18.7

Total fatalities to nontrespassers occurring at highway grade crossings, which are included in the foregoing table under the respective classes, declined 18.9 per cent, while non-fatal injuries fell off 18.1 per cent.

Net Income After Fixed Charges

For the first time, monthly returns from carriers of Class I were required by the Interstate Commerce Commission in 1932, in which the net income after fixed charges was reported. The aggregate for the first ten months of 1932 was a net deficit of $147,079,000, contrasted with a net income of $110,128,000 during the corresponding ten months of 1931. This one comparison pictures the railway financial situation in 1932, although drastic economies in operation brought about some improvement in the net position toward the end of the year.

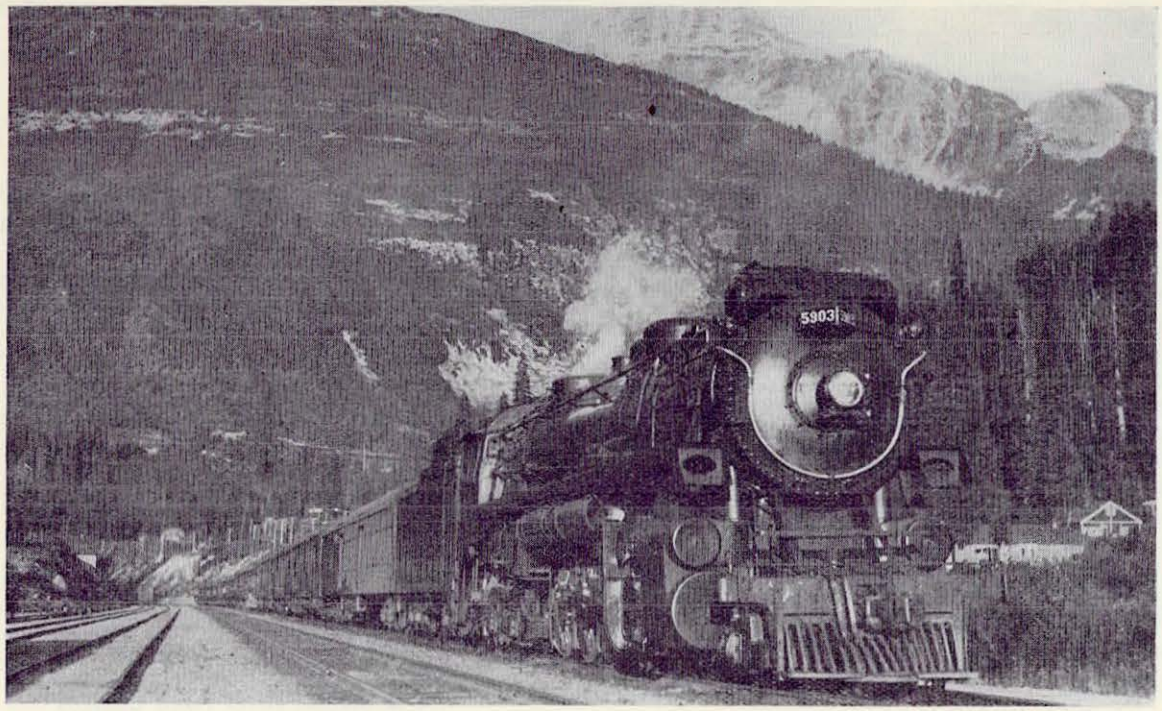
This subject leads directly to a consideration of railway receiverships. Four railways of Class I, operating 7,617 miles of line, went into the hands of receivers in 1932, bringing the total number of Class I carriers in receivership at the end of 1932 up to thirteen, with an aggregate length of 18,685 miles.

The other side of the same picture is the dividend situation. The total of railway dividends declared in 1932 fell off 73 per cent under 1931, and 1931 totals were more than one-third under 1930. The cumulative decline from 1929 to 1932 was more than 80 per cent.

Summary

For the third successive year, the story of railway operations in 1932 revolves principally around the word "decrease," practically every phase of operations being described by that term. Temporary relief in the form of increased rates applied to meeting emergency needs, and in the form of loans from the Reconstruction Finance Corporation, has done much to keep the railways moving. The rate increase was only about 2½ per cent, however, and the needs of the situation were far greater. Temporary relief by means of loans must be paid for at a later time, and adds a problem to be met in coming years. The basic problems of the rail industry, although receiving much attention during the year, remain nevertheless largely as open questions awaiting action.

The portals of the old year closed upon results which, we hope, will in years to come be referred to as the low point in the major economic depression of the twentieth century. The portals of the new year open to new possibilities. To what will time's pathway lead the railways in 1933?



The C. P. R.'s "Dominion" at Field, B. C.

Canadian Roads Have Trying Year

Bill calling for closer co-operation between leading systems faces protracted debate in Parliament

By J. G. Lyne
Financial Editor, Railway Age

AS a governmental problem, the railway situation in Canada is even more acute than it is in the United States. South of the international boundary there has been over-expansion in the transportation plant, just as there has been in the Dominion, but Uncle Sam's transport spree has been devoted largely to highways and waterways, and railways are in serious difficulties because of the competition of the tax-built facilities offered freely, or for a song, to their rivals. In Canada, however, there has not only been highway and waterway development, but railway building in advance of actual needs as well. And since the greater share of the mileage is owned by the government, instead of helpless private investors, as in the United States, the railway situation has forced itself into position as a political issue of the first magnitude.

One cannot imagine, for instance, a Canadian public man of any standing addressing a group of interests unfriendly to railway transportation, openly espousing their program and gratuitously suggesting that a "few railroads would have to go"—as did an important American political leader about a fortnight ago. On the contrary, in Canada not only the private investors in railways, shippers, taxpayers and railway employees, are aroused to the crisis which the railways face, but the national government itself has financial interests which are directly involved and which it must try to protect.

The future railway policy of the Dominion will come before Parliament at the session soon to convene with the certainty of protracted discussion, and the eventual outcome doubtful in the extreme. In 1931 the Canadian government named a Royal Commission, headed by Chief Justice Duff, to inquire thoroughly into the situation and to make definite recommendations for correcting unsatisfactory conditions. This commission reported in the early autumn of 1932 and its recommendations were incorporated in a bill introduced into the Canadian Senate, which was discussed for a week or two by that body prior to its December adjournment. In general, the report and bill provide for a maximum of co-operation between the two leading railways, the Canadian Pacific and the Canadian National, and the elimination of competitive facilities and services. The report also made definite suggestions as to the regulation and taxation of motor transport but, since this is largely a provincial rather than a Dominion matter, the correction of this phase of the railway problem is not involved in the bill now before the Senate.

Beatty Recalls Lord Shaughnessy's Proposal

To the minds of many Canadians the proposals of the Royal Commission go too far in eliminating competition but to another group, fully as articulate, they fall far short of the drastic action necessary to correct the existing ills. Of the latter, President Beatty of the Canadian Pacific is the spokesman and leader. He frankly favors amalgamation of the two systems. In a recent address he said:

"In 1921, Lord Shaughnessy proposed to the government that the outside enterprises of the Canadian Pacific

should be separated from its railway and ancillary enterprises and that the government should acquire the railway properties of the company, guarantee a certain fixed return to its shareholders, and, having acquired the G.T.P., Transcontinental, Canadian Northern and Intercolonial [all now parts of the C.N.R.], enter into a contract with the Canadian Pacific to administer and operate the whole property on account of the people of Canada. Lord Shaughnessy's plan was not acted upon. If it had been accepted hundreds of millions of dollars would have been saved to Canada, and we would, even under present conditions, not have had any serious railway problem on our hands.

"In 1925 a special committee of the Senate conducted a protracted investigation. After stating that in their opinion unless energetic means were adopted to reduce the national debt, the country would be unable to command the foreign capital necessary for development, the committee recommended the merging of the two railway systems for administration and operation under a board of 15 directors equally representing the two railways and the Canadian public. The report of the Senate was not acted upon largely because conditions and railway revenues improved and we entered upon the period of fictitious prosperity and free spending which has had a substantial influence upon the severity of the present depression. May I suggest that if the Senate's advice had been followed several hundred million dollars would have been saved to this country?

"The dangers of railway monopoly are now mythical. Railways may unite, but no transportation monopoly is accomplished by their union. We have three distinct and growing competitors, the lakes and rivers, the motor vehicles, and the airplane. A rail monopoly regulated by public authority and subject to the restraints that other forms of transportation competition will provide does not contain any element of menace or danger of unfairness to the shippers or traveling public under modern conditions.

"Important as has been the work of the Duff Commission, particularly in its marshaling of the facts and its analysis of the history of transportation in Canada, with its tragic consequences, it does not provide any adequate solution or ground for much hope to the sadly burdened Canadian taxpayers. The commission's chief recommendations as to future policy was the continuance of competition between the two railway systems qualified by co-operation between them enforceable by compulsory arbitration."

Some Oppose Duff Report as Going too Far

Opponents of amalgamation, even to the limited extent recommended by the Royal Commission, are quite as vocal as those favoring joint operation. Hon. Peter Heenan, who was Minister of Labor in the former Liberal government, in a recent address to Canadian National employees, said:

"When times were better under a Liberal government, the Conservatives claimed credit for the consolidation of various railway systems into a national system. During the election of 1930, the Conservatives promised not only extension of traffic channels, but aid to existing traffic channels, and the slogan of 'amalgamation never and competition ever.'

"What has followed? A policy of trade restrictions—a slashing reduction of the numbers employed—short time for those working and a reduction of wages was resorted to. Then there was appointed a Royal Commission to investigate railway affairs, but not one railway labor man was on that commission.

"We have before us the Duff report and legislation introduced by the government implementing its recommendations. So far as the employees are concerned, it means the amalgamation of the operation of the railways. The commission, and so far the government, has given consideration only to the savings of dollars and cents. To me it is as important that consideration be given to the human element connected with our railways."

The debate which impends will unquestionably explore the entire range of opinion between the boundaries laid down by the amalgamationists on the one hand and the separatists on the other. The debate promises to be interesting as well as enlightening. Canada has responsible party government which usually enables the party in power to force through any legislation which its leaders may favor; political free-lancing which is so prevalent in Washington is virtually unknown. All the same, the railway issue cuts sharply across party lines, which makes the outcome difficult to predict.

C. N. R. Increases Operating Net

It is, of course, the government-owned Canadian National which occupies the spotlight in the railway situation when viewed as a political problem. This property in only one year—1928 (which, rather than 1929, marked the peak of the boom in Canada)—earned enough to pay the interest on its obligations in the hands of the public. In all the other years advances by the government have been necessary to enable it to meet this interest. The decline of $150,000,000, or 48 per cent, in gross revenues from 1928 to 1932, of course, greatly aggravated this situation and has necessitated large advances from the Dominion government at a time when its revenues, like those of all governments, have been giving it cause for grave concern.

Heroic efforts were made, however, to reduce operating expenses and in 1932 net operating revenue of all but the Maritime lines (the accounts of which are kept separately) was increased by $2,500,000 to a total of

The "Maple Leaf" of the C. N. R. at St. Henri Station, Montreal

$10,000,000, in the face of a decrease in gross revenue of $38,000,000 from 1931. The deficit of the Maritime lines was sharply reduced. These and other interesting comparisons were made public in a recent statement by Acting President S. J. Hungerford. The total number of employees at the end of 1932 was 31 per cent less than in 1929 and total compensation 39 per cent lower. Costs of supervision were reduced 35 per cent.

Passenger train-miles in 1932 were 8¼ millions less than in 1929—equivalent to practically one-third the passenger train service offered in the former year. President Hungerford also pointed out that gross and net tons per train declined but slightly from 1929 to 1932, whereas gross ton-miles per train-hour, average speed and fuel efficiency were considerably improved. The percentage reduction in transportation expenses has been somewhat greater and in maintenance expenses somewhat less than those of the Class I railroads in the United States.

Capital expenditures, which totaled $91,550,000 in 1929, were reduced to $2,100,000 in 1932. The system's showing would, President Hungerford's statement said, have been about 4½ millions better had it not been for the premium on U. S. currency. He predicted that the system would quickly show improved net earnings and income from any betterment in traffic.

The Canadian Pacific in 1932 had operating revenues of $123,936,712, a decrease of $23,909,405 from 1931. Operating expenses were reduced by $18,574,624 and net operating revenue totaled $20,089,984, a decrease of $5,334,781 from 1931.

In a statement which recently appeared in the Gazette (Montreal), President Beatty, in commenting on the railway situation said, in part:

"The decrease in freight car loadings which began in 1930 has continued almost uninterruptedly. In 1931, up to the end of the first week of December, 558,359 fewer freight cars had been loaded on all Canadian railways than for the same period of the previous year. During the same period of 1932, 376,016 fewer cars were loaded than in 1931. The decline in passenger business has been relatively the same. The resultant effect upon railway earnings has been naturally disastrous. For the first ten months of 1931 Canadian Pacific gross revenue declined 22.1 per cent as compared with that of 1930. For the first ten months of 1932 there was a further decline of 15.4 per cent. The decline continues, and there certainly appears to be no evidence in sight that for many years we shall see these declines entirely eliminated and our earnings back where they were in 1928.

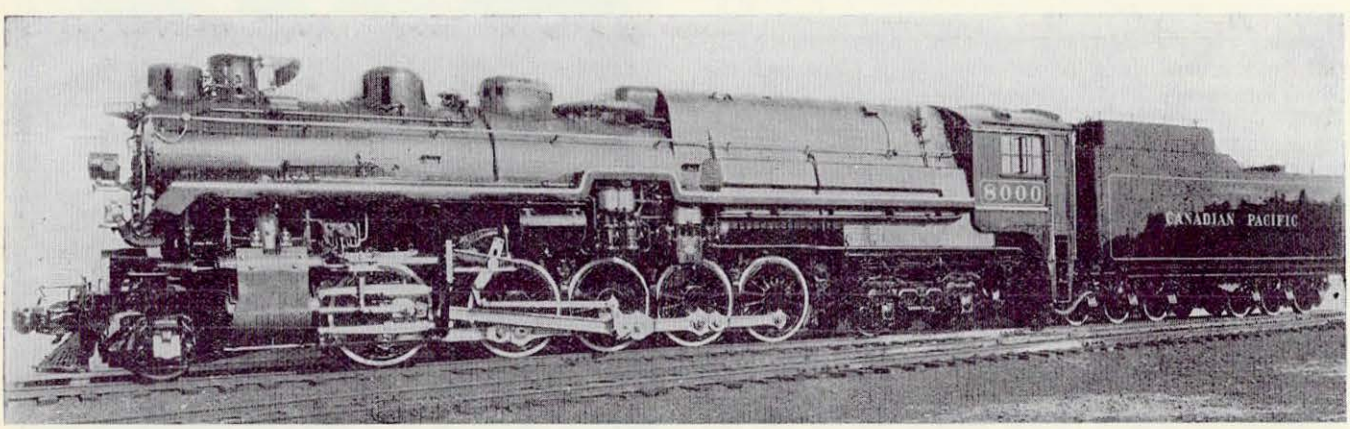
"It is true that the railways have effected drastic economies. As compared with 1931, Canadian Pacific operating costs for the first ten months of 1932 were 15.3 per cent lower, and we expect that we shall make a still better showing in this regard throughout the coming year. Here again the past twelve months have been a period of substantial progress. Having the best hope in the world, I hesitate to prophesy any great increase in gross earnings, and it is my deeply considered conviction that if the railways over the next ten or fifteen years are to live anywhere within their income, economies will have to go very much further indeed than has yet been considered by a great number of our people, who, it is only fair to state, have not had even a fair opportunity of informing themselves upon the situation.

"For years we have been impelled towards large capital expenditures, and at the same time competitive transportation agencies have been built up and maintained out of public funds. The Deputy Minister of Public Works for Ontario recently stated that the total cost of highways in Canada was $617,323,000, while the preliminary report of the Dominion Bureau of Statistics put the total expenditure for road construction for 1931 at $66,250,000. According to the Department of Railways and Canals, Canada's total investment in canals at March 31, 1931, was $236,216,461. For approximately eight months of the year they compete with the railways and they are toll free, their users contributing nothing to either operating costs or interest charges."

Second Line to Hudson's Bay

Capital improvements, as previously indicated, were sharply curtailed during the year. Construction of hotels by the C.N.R. at Saskatoon and Vancouver has been delayed and several branch lines of the C.P.R. on which track has been laid have not been put into operation. The Temiskaming & Northern Ontario, the Ontario government's line running northward from North Bay, was completed last summer to James Bay, the second Canadian railway line to reach Hudson's Bay tidewater.

The financial and public policies involved in the railway situation are perplexing the Dominion sorely. There is, however, no disposition to regard the railway as other than its prime reliance for transport. Air routes, to be sure, have found a definite and valuable place in the transport economy of the Dominion, but it is recognized that the railway alone can introduce all the amenities of modern living into newly-settled communities. Reliance on railways, therefore, has not waned by reason of the development of new forms of transport none of which offer an all-weather service sufficiently economical to supersede it.



C. P. R. Multi-Pressure Locomotive, Built at Angus Shops

On the National Railways of Mexico

Retrenchment Continued on Mexican Railways

Drastic economies offset part of decline in revenues— New management now in charge

IN spite of the drastic retrenchment resorted to by the National Railways of Mexico since the latter part of 1930, and developed with considerable force in 1931 and 1932, the operating results last year were not favorable, owing to the fact that the business depression reached a new low level in this period. The situation was further complicated by floods in certain regions served by the railway. Serious washouts, caused by heavy general rains, paralyzed traffic during several intervals in August and again in September. During the latter month, when the international bridge at Laredo was washed out, the operating ratio was 107.73.

Under the new management which has been in charge of the railways since August 11, the drastic program of economy initiated in 1930 was continued, culminating in the elimination of several departments, including the Office of Economical Studies, the Committee on Reorganization, and others. The Transportation Department was again centralized under Juan José Franco, general superintendent of transportation, and the two general superintendencies have been abolished. Although the lines of the National Railways of Mexico are quite extensive, the traffic handled is of such a nature that a centralized general office can conveniently supervise the operations over the entire system. This is especially true at the present time when the traffic to be handled is so reduced.

Operating Statistics

The monthly average operating statistics reflect the decline suffered by the National Railways during the year. During the first nine months of 1932, the monthly average locomotive mileage was 1,409,525, a reduction of 146,448 locomotive miles compared to that in each of the first nine months of 1931. Train mileage per month decreased from 1,233,569 to 1,129,831. Passenger car-miles amounted to 3,773,028 per month, a reduction of 106,098. Loaded freight cars made 7,215,761 miles per month, a reduction of 898,325 as compared to 1931, while empty cars made 3,682,086 miles per month during the first nine months of last year. Net ton-miles per month were 164,969,419, a decrease of 29,247,426 as compared to 1931, and gross ton-miles dropped from 481,338,930 to 417,978,865.

Freight car-days amounted to a monthly average of 461,135, in 1931, while in 1932 a drop to 444,107 was experienced. Commercial carloads decreased from 24,604 to 22,380. The ratio of loaded to total car-miles was 66.2 in 1932, as compared to 64.5 in 1931. Car-miles per car-day declined from 27.28 to 24.55, and net ton-miles per car-day fell from 475.5 to 430.9; the average tonnage loaded decreased from 24 tons per car to 23.

Operating Results

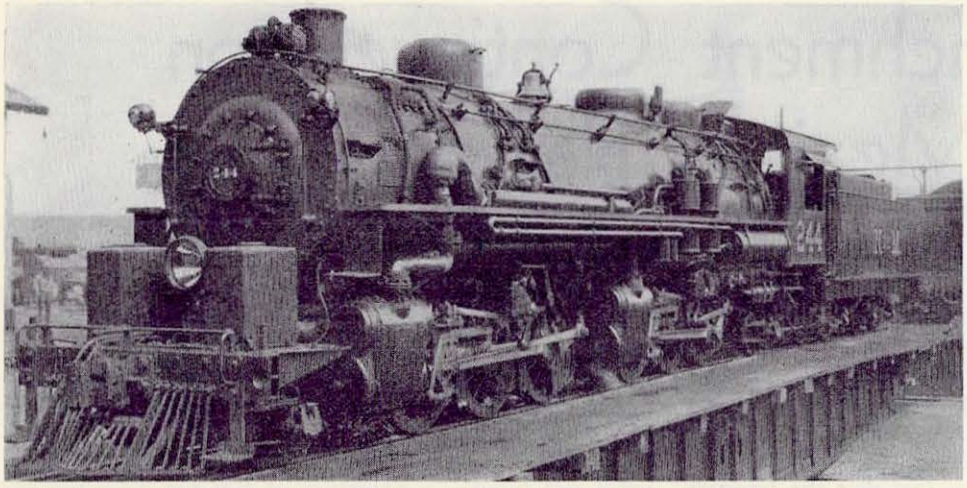
With these reductions in traffic, operating earnings naturally suffered a considerable decline. From January to September, 1931, freight revenues aggregated $47,365,394, while in the same period of 1932 they were only $38,376,717. Passenger revenues decreased from $13,385,255 in this period in 1931 to $10,772,153 in 1932. There was a decline from $5,805,664 in the first nine months of 1931 to $5,332,602 in 1932 in express revenues, and miscellaneous revenues declined from $1,467,182 to $1,020,184. Gross revenues decreased from $68,023,495 to $55,501,656.

Even though the operating expenses were reduced from $55,846,462 to $50,966,066, the reduction fell short

of the decline in gross revenues, since certain fixed expenses were not affected. As a result, during the first nine months of 1932, net operating revenues were only $4,535,590, as compared to $12,177,033 in the first nine months of 1931. The operating ratio in the first three quarters of 1932 was 91.83 per cent, compared to 82.10 per cent in 1931.

In view of the heavy downward trend in the traffic handled, it would have been natural if there had been an increase in the cost per 1,000 gross ton-miles. However, there was actually a decrease in this cost, the reduction having been from $1.90 to $1.84. This economy was obtained in spite of the fact that fuel consumption increased during 1932. Unit costs in mixed service also decreased in 1932, from $2.55 to $2.48 per 1,000 gross ton-miles.

Total train mileage decreased 146,448, but an adjustment of direct train expenses brought about a decrease in costs per freight train-mile, from $1.18 to $1.11. A factor which entered into the decrease in costs was the greater freight train speed, an increase from 13.9 miles per hour to 14.3 having been attained. Passenger train costs per mile were reduced from $0.76 to $0.74. Mixed trains, however, registered an increase in cost per mile, from $0.94 to $0.97.



One of the National Railways' Narrow-Gage Mallet-type Locomotives

Fuel Performance

During the first nine months of 1931, freight trains on the National Railways consumed an average of 54.6 lb. of coal per 1,000 gross ton-miles, while in the same period of 1932 this consumption decreased to 48.0 lb. On the other hand, mixed trains showed an increase in fuel consumption from 56.4 to 60.8 lb. The relative unimportance of this increase, however, is indicated by the fact that coal consumed represents only 10 per cent of the total fuel consumed.

Fuel oil consumed by freight trains increased from 20.1 to 20.3 gal. per 1,000 gross ton-miles, but decreased from 23.1 to 22.3 gal. in mixed service. The higher consumption by freight locomotives was due to the decline of freight traffic. Even though the number of freight trains run was reduced, the trains handled less tonnage. Mixed trains, on the other hand, were loaded more nearly to capacity, resulting in the reduced consumption of fuel oil per gross ton-mile.

With a view to controlling more efficiently the handling and consumption of fuel, the office of superintendent of fuel and lubricants was created in October, 1932. Although time has not permitted other than preparatory work, some good measures of economy have already been introduced. Fuel inspectors have been sent over the road to ride engines and observe the operation of fuel-saving devices, the condition of locomotives, and the methods employed by engine crews. Considerable information of importance is being obtained, which will serve as a foundation for measures taken to obtain better fuel performance.

The number of serviceable locomotives stored increased by 30. The year brought higher locomotive and car repair costs, due to the higher cost of imported materials and to the inability to reduce forces to the extent justified by shop production, on account of certain labor conditions and the laws of the country. Locomotive repair costs in roundhouses increased from $18.85 to $19.35 per locomotive, but the handling cost was reduced from $11.97 to $11.04 per locomotive. The monthly average cost of repairs and handling amounted to $417,042 during the first nine months of 1931, while in 1932, these costs were reduced to $360,744.22. Man-hours per locomotive dispatched were reduced from 46 to 45.

The cost of shop labor per 1,000 miles run amounted to $358.53 in 1931 and to $396.22 in 1932. The cost of material, on the same basis, increased from $162.13 to $212.97. The cost of labor for car repairs per 1,000 miles run increased from $16.66 to $16.92, while material cost increased from $20.61 to $22.90.

Labor Conditions

There were no labor complications during the year, in spite of the fact that the Mexican railways continued to reduce the number of employees. In 1930, a total of 46,604 employees were on the payroll. In 1931, the monthly average for the entire year was only 37,236. In September, 1932, 34,677 employees were at work, reducing the monthly payroll to $3,940,693.97.

Late in 1932 the 17 railroad unions assembled in Mexico City principally for the purpose of forming one union to take the place of all the others. Recent developments have indicated that the company and its personnel are on more friendly terms than ever.

The interchange of traffic with railways in the United States suffered a considerable decrease, especially with respect to freight moving into Mexico. Through the Laredo gateway, a monthly average of 376 cars were received by the National Railways in 1931, while in 1932, the number declined to 219. The reduction in the number of cars received at Eagle Pass was from 115 to 47, and at Brownsville from 12 to 5. There was an increase in the monthly average at El Paso from 138 to 144 cars.

Three Years of Under-Maintenance

Application of limited appropriations to general upkeep has resulted in an enormous accumulation of deferred renewals

FOR three years the railways have suffered a continuous decline in traffic and revenues. During the same period they have effected a continuous decline in their expenditures for the maintenance of the property. The declines in expenditures have been at a greater rate than have those in the factors which cause wear and tear. The result has been a heavy accumulation of deferred maintenance, in evaluating the extent of which various classes of property must be considered separately.

Decline in Maintenance-of-Way Expenditures

The expenditures of the Class I railways for maintenance of way and structures in 1932 totaled approximately $357,000,000, or less than half the corresponding outlay in 1929. More specifically, they amounted to 42 per cent of the average annual expenditures for the seven years 1923 to 1929, inclusive, and were less than for any year since 1909. It is of interest to note that maintenance of way operations were depressed to this low level during 1932 by progressive annual reductions of 151 million, 177 million and 179 million dollars, respectively, during the three years of the depression, or, if we were to take the average annual expenditures for the seven years ending with 1929 as a standard then the deficiencies in the three following years amounted to 132 million dollars for 1930, 309 million dollars for 1931 and 488 million dollars for 1932, or a total accumulated deficiency to date of 929 million dollars. This figure, of course, is excessive because it is necessary to take into account the reduction in wear and tear on the tracks and structures to be expected with the concurrent decrease in the traffic moved. This is illustrated in the following table which shows in parallel columns the deficiency in expenditures for maintenance of way and structures and the corresponding deficiency in freight traffic, compared with the average for the seven years ending with 1929.

Expenditures for Maintenance of Way and Structures, Class I Railroads

1920	$1,030,504,000
1921	764,662,000
1922	736,181,000
1923	821,913,000
1924	802,673,000
1925	824,320,000
1926	877,877,000
1927	879,496,000
1928	848,313,000
1929	864,704,000
1930	713,340,000
1931	536,305,000
1932	357,000,000

	Percentage Reduction in Expenditures	Per Cent Reduction in Freight Traffic, Gross Ton-Miles
1930	16	5
1931	37	20
1932	58	38

Efforts have been made to determine the relation between traffic and the outlay for maintenance, but because of the extraordinary conditions that have beset the railways in the last three years, relationships have been so drastically altered that it is doubtful if any speculation on the influence of decreased traffic would be fruitful of valid figures for a normal decrease in maintenance expenditures. There are, however, other data that may be developed for the purpose of throwing more light on the deficiency of maintenance of way operations during the last three years.

More Labor—Less Material

One measure of this is to be found in the relation of maintenance of way expenditures for labor to those for material, an index of which is given by a comparison of the total expenditures with the total compensation of maintenance of way employees. Thus, the ratio of wages to total expenditures for maintenance of way and structures during the last eight years are as follows:

Year	Per Cent
1932	59.6
1931	55.3
1930	55.2
1929	54.3
1928	53.2
1927	53.4
1926	53.0
1925	52.4

Inasmuch as the objective is to show the effect of the amount of labor employed rather than the wages paid, the percentage for 1932 was determined after making a proper adjustment for the 10 per cent reduction in wages. However, in spite of this, the steady increase in the proportionate outlay for labor does not tell the whole story, because it does not take account of the increase in the output of work per man-hour that has attended the steadily growing surplus of labor. This analysis indicates very definitely that a relatively larger proportion of the expenditures has been devoted to general upkeep as compared with that for the application of materials, than was the case under normal conditions in recent years. Or, expressed in another way, every effort has been made to keep the property in a safe and usable condition while deferring renewals of materials to as great an extent as possible.

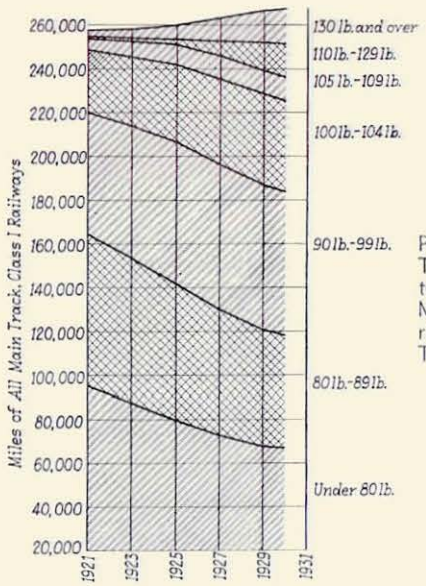
Large Deficiency in Rail Renewals

What has happened with respect to renewals can be shown by considering separately the figures for the renewals of the two primary track materials—rails and ties. Thus, the following table shows the tons of new rails laid in replacements by Class I railways from 1927 to 1932, inclusive. The figures for 1927 to 1930 were taken from the Interstate Commerce Commission statistics while the figures for 1931 and 1932 are approximations.

Year	Tons of Rails Laid in Replacement	Approximate Deficiency*
1927	2,125,000	
1928	2,080,000	
1929	1,958,000	
1930	1,517,000	480,000
1931	960,000	1,040,000
1932	500,000	1,500,000

* Based on an assumed normal application at 2,000,000 tons.

Another measure of the decrease in the application of rails is given by the following table of rail renewals by



Progress in the Movement Toward Heavier Rail, 1921 to 1930, as Shown by the Mileage of Rails of Various Weights in Main Track of Class I Railways

Class I railways in the five years ending with December 31, 1931, in terms of miles of track relaid.

Rail Replacement by Miles of Track

	1931	1930	1929	1928	1927
New Rails	5,595	8,806	11,429	12,304	12,876
Total, including relayers	10,622	16,718	22,912	24,376	25,049

If we were to assume that 2,000,000 tons represents the normal tonnage required for renewals, then the apparent deficiency at the end of 1931 was about 1,500,000 tons, or 75 per cent of the tonnage required for a normal year's operations. A check on this conclusion is afforded by assuming, on the basis of the above table, that rails must be replaced with new rails on 12,000 miles of track annually. This indicates a deficiency at the end of 1931 of 9,600 miles or 80 per cent of a normal year's requirements. Carrying these figures through 1932, the deficiency in rail replacements is in excess of 3,000,000 tons.

This conclusion ignores entirely the fact that the decline in traffic has been responsible for an appreciable decrease in the wear of rail, so that it cannot be assumed that rail renewals were required during the last three years on the same scale as in the preceding five or more years. Consideration must be given also to the marked progress that has been made in conservation measures that are greatly prolonging the life of rail. In fact, there is reason to believe that the perfection of the more advanced practices will be effective in permanently reducing the demand for rail appreciably below the tonnage normally required in the past years of average traffic, unless we are to anticipate a further movement toward the laying of heavier rails. That this development is not without its possibilities is indicated by the fact that, although much is said about rails weighing 110 lb. or more, the mileage of track laid with such weights is still an insignificant proportion of the total main line mileage, as shown in the chart.

Renewal of 60 Million Ties Deferred

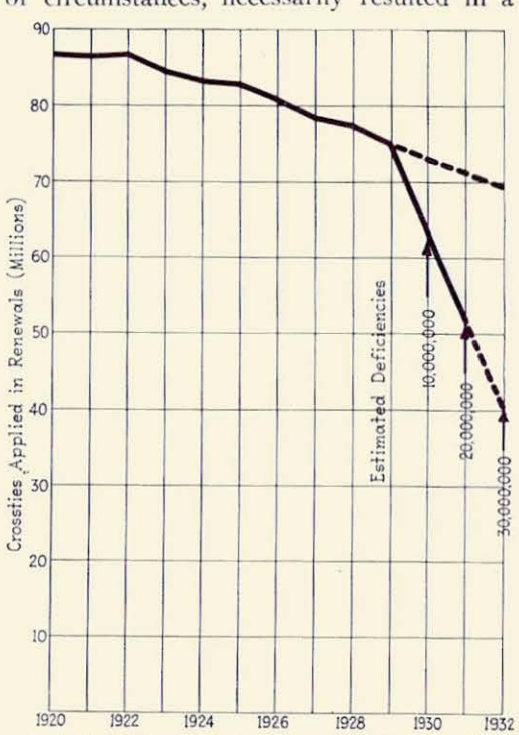
The situation with respect to tie renewals is clearly demonstrated in the chart which shows the number of crossties applied in replacements in the years 1920 to 1932, inclusive, the figure for 1932 being an estimate based on available data covering purchases and reductions in stocks. That the annual tie requirements of the railways are decreasing is evident from the trend of the renewals from 1922 to 1929, and it has been assumed for purposes of estimate that the normal requirements would continue to decrease as indicated by the dotted line projected from 1929 through 1930, 1931 and 1932. The deficiency of the actual renewals in those three years as compared with the assumed normal requirements as scaled from the diagram, total approximately 60,000,000 crossties, or nearly one year's normal requirements.

Tie renewals are affected in some measure by the volume of traffic but only in a minor degree as compared with rail renewals or surfacing operations. In view of this and the further fact that renewals in the future will be affected by a temporary increase in the use of untreated ties, it is felt that the above figure is a fair estimate of the current deficiency in tie renewals.

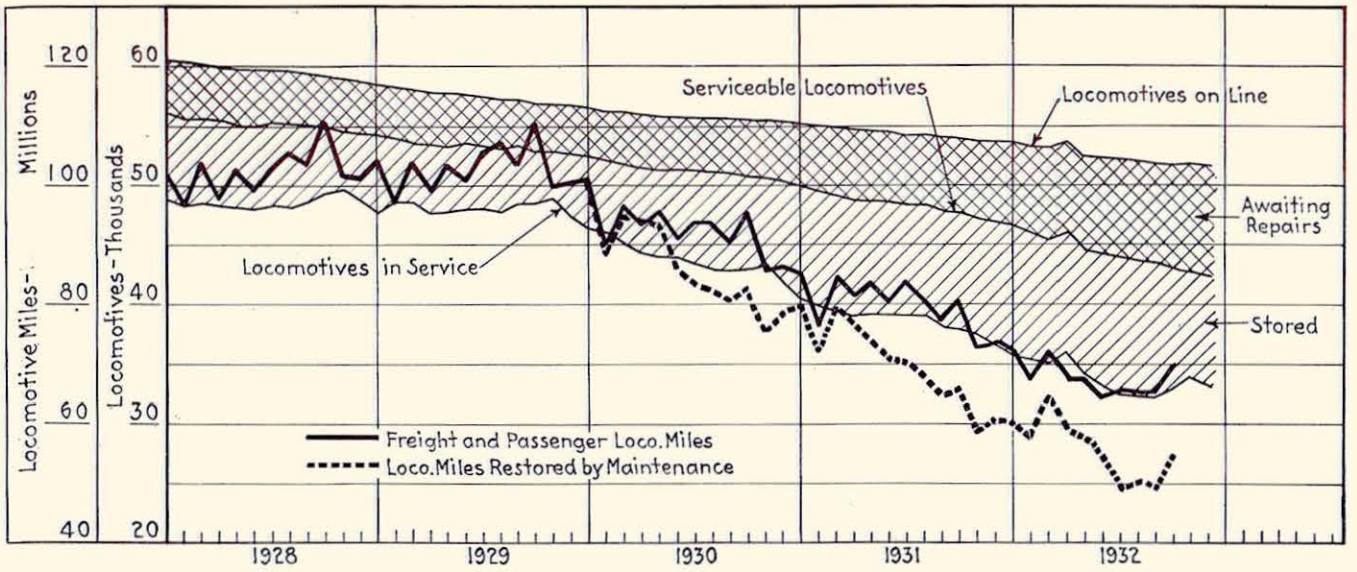
Considered by itself an accumulated inadequacy of tie renewals nearly equaling a normal year's requirements might be taken as evidence of a serious reduction in average tie condition. But when it is recalled that as late as 1919 it was estimated that the annual tie renewals were double the average annual requirements at present, it becomes apparent that the current deficiency in tie renewals is not a serious matter from the standpoint of safety of operation. Furthermore, by the very reason of the important part that the crosstie plays in the safety of track, crosstie condition is being accorded greater attention than any other unit of the track structure. Nevertheless it is the accumulated deficiency in renewals that must be reckoned with in any estimates of the necessities imposed in restoring the railways to a state of normal maintenance.

Many Items Cannot be Evaluated

Unfortunately no corresponding figures can be developed with respect to other items that enter into track maintenance, or in regard to bridge and building maintenance. In general, however, the conditions imposed are distinctly parallel to those presented in track maintenance, with perhaps a greater tendency toward emergency measures—confining expenditures to those things that have to be done within a period of a few months rather than to consider the maintenance program from the standpoint of a year's work. This policy, imposed by force of circumstances, necessarily resulted in a post-



Crossties Applied in Renewals by Class I Railways. The Vertical Distances Between the Dotted (Normal Renewal) Line and the Lower (Actual Renewal) Line Afford a Measure of the Deficiency



Trends in the Use and Maintenance of Locomotives

ponement of many renewal projects that cannot be put off much longer.

Maintenance of way and structures embraces such a variety of operations that it is impossible to integrate all of the factors involved in such a way as to arrive at any accurate conclusion concerning the extent of the accumulated deferred maintenance. The curtailment of expenditures for different items produces widely different results. For example, a reduction in weed mowing, while it is undesirable, results in a direct and permanent saving, while the failure to carry out a normal painting program gives rise to even greater expenditures at some later date. However, as an approximation it would appear that the railways are about a year behind in their maintenance of tracks and structures.

The Equipment Situation

The expenditure for maintenance of equipment in 1932 approximated 627 million dollars, a decline of about 47 per cent from the 1928-1929 average. This average itself was lower than the figures for any of the preceding years since 1920. When considering the effect of the depression on maintenance, however, it has been chosen as the basis of comparison because it represents more nearly normal maintenance than any of the preceding years. The extraordinary maintenance programs undertaken in 1923 continued with decreasing effect for the succeeding four years.

The extent of the decline in the use of equipment during the past three years has been considerably smaller than this decrease in total maintenance expenditures. In the case of freight cars, again using the 1928-1929 average as the basis of comparison, freight-car miles had declined 10.3 per cent in 1930; 24.2 per cent in 1931, and 42.2 per cent in 1932. In the case of road-locomotive miles, the declines were 10, 22 and 34 per cent, respectively. In the case of passenger cars, mileage has been reduced by 29 per cent.

Locomotives

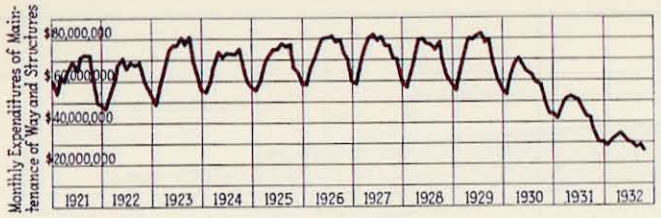
While the relation between the decline in total maintenance expenditures and in the extent to which the equipment is being utilized indicates that maintenance is being deferred to a marked degree, particularly with respect to locomotives, a better evaluation of the extent to which this deferred maintenance has accumulated during the past three years of steadily declining business can be obtained by a comparison of the month-to-month change in locomotive-miles being run out in road service and the changes in the amount of man-hours consumed in the maintenance and repair of locomotives. The total man-hours paid for in the maintenance-of-equipment and stores departments averaged 92.3 million per month during 1928 and 1929. This average progressively declined to 77.1, 60.3 and 46.2 million man-hours per month for 1930, 1931 and 1932, respectively, the average for last year being half of the average for 1928 and 1929.

In the chart are shown the facts pertaining to the trend of the motive-power situation during these three years. There has been a steady decline in the total number of locomotives in service on the Class I railways, and an increase in the number of locomotives out of service in or awaiting shops—an increase which has been taking place at a steadily growing rate. The tremendous decrease in the volume of traffic as evidenced by the declining curve of locomotive-miles is reflected in the large increase in locomotives reported as stored serviceable.

Depression Trends in Utilization and Maintenance of Locomotives and Freight Cars

	Total M. of E. expense (000)	Per cent reduct. from 1928-29 average	M. of E. and Stores total hours of labor paid for* (000)	Per cent reduct. from 1928-29 average	Freight and pass. loco.-miles (000,000)	Per cent reduct. from 1928-29 average	Mach. & B. M. hours of labor paid for* (000)	Per cent reduct. from 1928-29 average	Freight car-miles (000,000)	Per cent reduct. from 1928-29 average	Carmen hours of labor paid for* (000)	Per cent reduct. from 1928-29 average
1928	1,166,942	...	92,409	...	1,226	...	14,595	...	28,357	...	15,557	...
1929	1,199,402	...	92,155	...	1,233	...	14,481	...	29,124	...	15,704	...
1930	1,015,824	14.4	77,147	16.0	1,112	10.0	12,363	15.0	25,800	10.3	12,777	18.4
1931	816,953	30.8	60,288	35.0	959	22.0	9,954	32.0	21,766	24.2	9,858	37.0
1932†	627,400	47.0	46,201	50.0	811	34.0	7,885	46.0	16,920	42.2	7,494	52.0

* Monthly average.
† Estimates.



Expenditures for Class I Railways for Maintenance of Way and Structures by Months

Using the sum of boilermakers' and machinists' hours paid for monthly as an index of the extent to which locomotive repairs are being made, it will be seen that there has been a steadily widening gap between the work done in restoring locomotive-miles and the mileage being run out in service. For the three years the accumulated deficit amounts to approximately 350 million locomotive-miles, an amount equivalent to between three and four months' service at the 1928-1929 level of operation, and between five and six months' service at the present rate of locomotive utilization. During the latter half of 1932 maintenance had so far declined that it amounted to not more than 75 per cent of the full requirements and the deficit was accumulating at the rate of nearly 16 million locomotive-miles per month.

This estimate is based on the assumption that each hour of labor, whether expended in the enginehouse or the backshop, has an equal effect in restoring run-out mileage. This, of course, is not true as the labor in the enginehouse is expended on running repairs and that in the backshop makes the class repairs which restore the run-out mileage life of locomotives. When it is considered that the reductions in the labor hours have been much more extensive in the backshop than in the enginehouse, it is evident that the above estimate is an extremely conservative one. There are, however, too many variations in practice with respect to the proportions of labor employed in the backshop and enginehouse to justify an attempt to take this condition into account on a quantitative basis.

But the reduction in labor itself does not tell the whole story as to the extent of accumulated deferred maintenance. The decline in the dollar volume of material purchases has been much greater than the decline in the labor hours expended in equipment maintenance. In the case of tubes and flues, for instance, the purchases in 1932 amounted to scarcely more than 20 per cent of the average of 1928-1929. This is true also of locomotive and car castings, beams, couplers and car roofs. The dollar volume of the purchases of all materials other than fuel, ties and rail had declined to 30 per cent. From the standpoint of material, therefore, after making allowance for the effect of declining prices, the amount available has not been sufficient to restore completely more than one-half the mileage run out during 1932 and during the three years of the depression there has been a cumulative material deficit equivalent to over 800 million locomotive-miles. Some of this material shortage has been made up at the expense of labor, but shop labor used in reclaiming or manufacturing materials customarily purchased is not available for strictly maintenance operations. Any reduction in the estimate on this account would, therefore, need to be added to the estimated labor shortage.

The material deficit is much larger than is represented by the increase in number of locomotives reported in or awaiting shops. It represents a tremendous robbing of locomotives which are awaiting shop or are reported as stored serviceable. There are probably few locomotives not actually in use which can be placed in service without requiring the restoration of some missing part or parts.

Freight Cars

In the case of freight cars, the condition of the equipment cannot be clearly shown statistically. Freight-car miles have been subject to progressive reductions which exceeded 40 per cent in 1932 as compared with the 1928-1929 average. But a considerable part of the deterioration which has to be restored by maintenance is the result of the action of "time and the elements"* and continues to accumulate on surplus cars as well as on those being utilized in handling current business. As a result of this condition, the expenditure necessary to restore deferred maintenance is proportionately much greater than the mileage service would indicate.

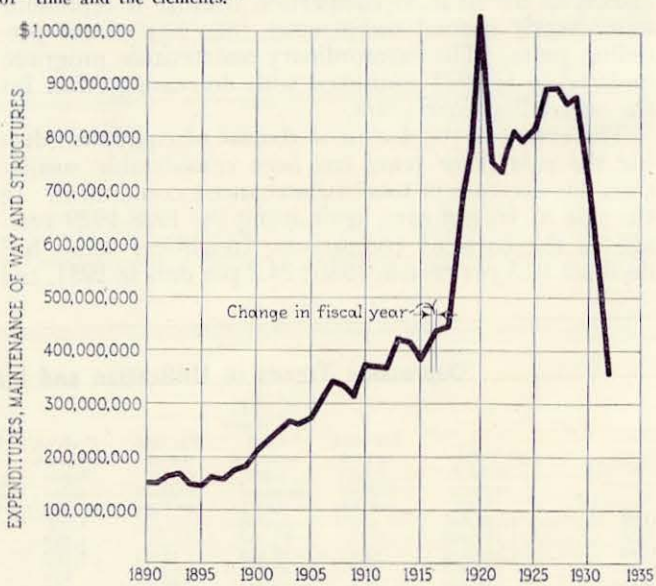
On the basis of the ratio between freight-car miles and the hours of labor of carmen in 1928-1929, the equivalent of about nine billion car-miles of deferred maintenance has accumulated during the last three years. This is equivalent to nearly four months of normal service and over six months of service on the 1932 level. Again, however, as in the case of locomotives, the deficiency in materials has been much greater than that of labor, and for 1932 amounts to more than half when the effect of "time and the elements" is taken into consideration.

Passenger Cars

In the case of passenger cars, the combined effect of time and the elements and of service on the interior appointments and finish of the cars is the cause of nearly two-thirds of the maintenance. As the need for maintenance from these causes has no effect on the ability of the equipment to withstand the conditions of train service safely, it is possible to effect a large reduction in current expenditures for passenger cars without much relation to the extent of the service being rendered. While detailed figures for the passenger-car repair expenditures during 1932 are not available, the record for the preceding year indicates that the reduction has been approximately in the same proportion as that for steam locomotives. Considering the relatively small reduction in mileage of passenger equipment as compared with

(*Continued on page 178*)

* In a study of freight-car maintenance on a western railroad made in 1917, 30 per cent of the maintenance was found to be required by the effects of "time and the elements."



Annual Expenditures for Maintenance of Way and Structures from 1890 to 1932, inclusive

Laying Track on the Childress-Pampa Line of the Fort Worth & Denver Northern

Railway Construction at Low Ebb

Mileage of new lines lowest on record, while there was a marked decrease in other construction in 1932

By George E. Boyd
Associate Editor, Railway Age

CONFIRMING the forecast made in these columns a year ago, there was a marked decrease in the construction activities of the railways during 1932. In fact so great was the recession that the mileage of new lines completed in the United States during the year was less than for any year since the Civil War, while the volume of other construction stands in sharp contrast to that of any year since 1902, when these records were started. In further contrast with previous years, only a limited amount of new work was started during the year, most of that which was under way having been carried over from previous years. For these reasons, an unusually high percentage, as compared with the total number of projects, was completed during the year, with the result that the carry-over into 1933 is correspondingly small. It may be expected, therefore, that 1933 will witness a still further recession in railway construction, particularly in the number of large projects.

This recession has not been confined to any one class of work, but has affected all types of improvements alike. Of the new work started during the year, a relatively large amount was undertaken in response to public demand for the elimination of grade crossings. The Pennsylvania, however, has prosecuted vigorously a large number of important projects, in the belief that it can complete the work at this time with a smaller investment and less interruption to traffic than if it waits on full recovery from the conditions that now confront the railways. Likewise, the New York Central has carried forward its West Side improvements in New York at substantially the rate called for in its original program.

Despite the record, the outlook is far more encouraging than would appear from casual consideration. Although the railways have spent an average of $750,000,000 a year for improvements and extensions during the last decade, the railway plant is still far from complete. A revival of business and industrial activity will not bring a still more insistent demand for greater economies in operation, but the public is constantly demanding higher standards of service, which can be met only by further improvements on a scale comparable to those of the last decade.

During the last three years, changes and refinements which have been made in operating methods have resulted in marked economies. It is obvious, however, that as traffic increases, additional construction of major importance will be necessary to make these newer methods effective. During the present comparative inactivity, the railways have had an opportunity to review and analyze their future requirements carefully, and most of them have tentative programs for future improvements which will be launched actively as soon as conditions warrant. In addition to these internal improvements, certificates have been issued by the Interstate Commerce Commission for a considerable mileage of new lines, on which work has not yet been started but most of which may be expected to be placed under construction as business activity approaches normal.

Predictions with Respect to New Mileage Fulfilled

For many years the milage of new lines under construction or completed in any year has been regarded as an index of the construction activities of the railways as a whole. It was predicted a year ago, in reviewing the construction record of 1931, that the new mileage completed in 1932 would be small. That this forecast

was correct is confirmed by the fact that only one major project of this character was under construction during the year, this being the line of the Ft. Worth & Denver City between Childress, Tex., and Pampa, 110 miles. While this line was completed during 1932, construction was started in 1931, being well advanced at the end of that year.

Including this line, a total of only 163 miles of new road was constructed during the year, this being the smallest mileage for any year since the Civil War. This compares with the previous low record of 314 miles in 1920 and is in sharp contrast with the maximum of 6,026 miles which was recorded in 1902. Aside from the Childress-Pampa line, the largest single project of this character completed during the year was the new road, 20 miles long, which was constructed from the rim of the Grand Canyon near Boulder City, Nev., to the site of the Hoover dam. The next most important new-line project was virtually a relocation by the Great Northern of a part of the old Shevlin-Hixon Railway which was built originally as a logging road, but in which the Great Northern now owns a three-fourths interest, and which it is using as a link in its line to California. Because of alinement and grade conditions on this road it could not be used for through traffic and it became necessary to construct an alternate line with more favorable operating characteristics between Bend, Ore., and Lava, 14 miles. The old line between these points will not be abandoned, but will continue to be operated as a logging road. The only other new line construction of importance from a mileage standpoint was that of the Union Pacific between Rioco, Cal., and Wilmington, 8.5 miles, which was undertaken for the purpose of removing the tracks of this company from the water front and important streets of Long Beach.

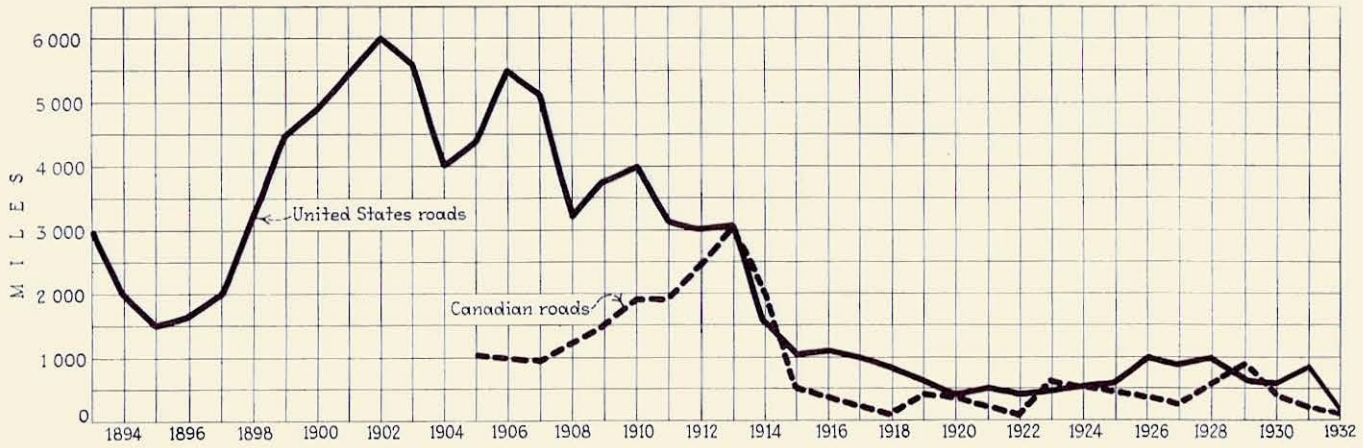
Only one new-line project of consequence was started during the year, this being the line between Dotsero, Colo., and Orestod, 38.71 miles, which is being built by the Denver & Rio Grande Western to connect with the Denver & Salt Lake, and thus provide a new and shorter route for traffic between Denver, Colo., and Salt Lake, Utah. This project, which was started just at the close of the year, will involve some exceptionally heavy work in the rough mountainous country through which it passes. Among the uncompleted work, the Virginian has under construction 11 miles of new line to complete the last section of its 44-mile Guyandot river line between Elmore, W. Va., and Gilbert, to connect at the latter point with the Chesapeake & Ohio and the Norfolk & Western.

During the year ending October 31, nine applications were filed with the Interstate Commerce Commission requesting authority for the construction of 851 miles of new line, in addition to a number of applications pending at the beginning of the year. Including the latter, 10 applications for 953 miles were denied and three applications covering 337 miles were dismissed.

During 1932 the commission authorized the construction of only 38 miles of new lines, of which 2 miles was for an extension to an interurban railway. At the end of the commission's year, (October 31), however, there remained outstanding authorities for 1764 miles of new lines, only a small number of which, including those completed or already mentioned as under way, have as yet been started. In addition, 1,400 miles of lines for which authority had been issued have been deferred or abandoned permanently.

Miles of New Main Track Built in 1932

United States	Number of Companies Building	First Track	Second Track	Third Track	Fourth Track	Total
Arkansas	1	0.12	.....	.....	.....	0.12
California	2	9.37	.....	.....	.....	**9.37**
District of Columbia	1	1.14	.....	.....	.....	1.14
Indiana	1	1.41	.....	.....	.....	1.41
Maryland	1	.....	.....	1.25	1.25	2.50
Missouri	2	0.79	0.48	.....	.....	1.27
Nevada	1	20.00	.....	.....	.....	20.00
New York	1	0.99	0.82	0.11	.....	1.92
Oregon	1	13.84	.....	.....	.....	13.84
Texas	1	113.60	.....	.....	.....	113.60
West Virginia	1	1.80	0.91	.....	.....	2.71
		163.06	2.21	1.36	1.25	167.88



New-Line Mileage Constructed in the United States and Canada

Miles of New Line Completed in the United States Since 1893

1893	3,024	1913	3,071
1894	1,760	1914	1,532
1895	1,420	1915	933
1896	1,692	1916	1,098
1897	2,109	1917	979
1898	3,265	1918	721
1899	4,569	1919	686
1900	4,894	1920	314
1901	5,368	1921	475
1902	6,026	1922	324
1903	5,652	1923	427
1904	3,832	1924	579
1905	4,388	1925	644
1906	5,623	1926	1,005
1907	5,212	1927	779
1908	3,214	1928	1,025
1909	3,748	1929	666
1910	4,122	1930	513
1911	3,066	1931	748
1912	2,997	1932	163

New Mileage in Canada and Mexico

The mileage of new lines completed in Canada totaled 121 as compared with 250 in 1931 and 385 in 1930. This was the lowest since 1904 when this record was started. It compares with 135 miles in 1918, the previous low, and 3,013 miles in 1913 in which year the largest mileage was completed. The Canadian Pacific

placed 169 miles of new line in operation during the year, but of this two lines aggregating 53 miles were reported as completed in 1931. The Canadian National reported that it laid a total of 45 miles of track during the year on new lines under construction, of which 5 miles was placed in operation on two line diversions, where the old lines were abandoned when the new work was placed in operation.

Railway construction in Mexico remained at a standstill. No new mileage was under construction and no other construction of importance was undertaken. A comprehensive survey of the transportation needs of the country has been under way for several years, and as a result a large mileage of new lines is projected, on a part of which the surveys and estimates have been completed. There is little prospect, however, that any of the proposed construction will be undertaken in the immediate future.

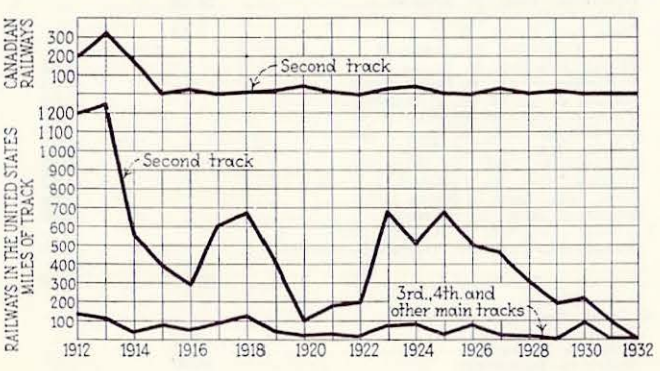
Miles of New Lines Completed in Canada Since 1904

1904	316	1919	433
1905	1,181	1920	305
1906	1,007	1921	252
1907	976	1922	145
1908	1,249	1923	655
1909	1,488	1924	615
1910	1,844	1925	414
1911	1,898	1926	335
1912	2,232	1927	310
1913	3,013	1928	723
1914	1,978	1929	841
1915	718	1930	385
1916	290	1931	250
1917	207	1932	121
1918	135		

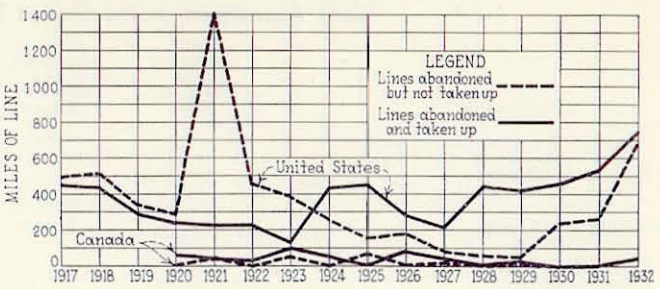
Multiple Track Mileage

For reasons which have been mentioned repeatedly, largely because of the advances which have been made in the art of signaling and of traffic control, the mileage of new multiple tracks has been declining steadily for several years, even in the face of increasing traffic. As might have been expected, therefore, in view of the marked decline in traffic which continued through most of the year, there was no demand for additional main tracks to increase the traffic capacity of any of the lines. As a result, only 2.21 miles of second track, 1.36 miles of third track and 1.25 miles of fourth track were completed during the year. While these projects increased the total multiple track mileage by the amounts given, they were in the nature of internal improvements rather than extensions.

On the other hand, in strong contrast with the large mileage of second track which was constructed annually for many years, and even for several years subsequent to 1926, the year in which the present decline in this type of construction first became apparent, during 1932 a number of roads found it to their advantage to abandon, at least temporarily, the use of one track on certain double-track lines. The most notable example of this change in operating methods was on the Chicago,



Multiple-Track Mileage Constructed in the United States and Canada



Mileage of Lines Abandoned in the United States and Canada

Milwaukee, St. Paul & Pacific, which reverted temporarily to single-track operation on more than 200 miles of double-track lines at various points on its system, thus saving in maintenance expenses at the rate of $1,000 a mile a year over the territory affected by the change.

Miscellaneous Projects

Although made up of a large number of individual units, the West Side improvement of the New York Central, taken as a whole, remains the largest single project now under way in this country, representing a total ultimate expenditure of $175,000,000. While much of this work has been completed, work has continued throughout the year substantially on schedule. The project as a whole involves the relocation and elevation of all tracks on the west side of Manhattan, the elimination of 90 street crossings at grade, the construction of an elevated express highway covering the tracks, and a large amount of miscellaneous construction, which includes the relocation of sewers, new warehouses, freight houses, team yards and numerous other facilities.

The electrification program of the Pennsylvania remains the next largest railway project under way. Originally planned to extend between New York and Philadelphia, it has been extended to Washington, D. C. The electrification work on the line between New York and Philadelphia has been completed and was placed in operation late in January, 1933. Work on the electrification to Washington has been prosecuted vigorously during the year, and will be continued through 1933. Work on the Philadelphia improvements has been continued during the year and the present prospect is that this project will be completed according to schedule during 1934. Other projects of magnitude now under way on this road include a new station and other buildings and track elevation through Newark, N. J., together with three new bridges over the Passaic river, the total cost of which will be $25,000,000; the construction of a new line through Baltimore, Md., at a cost of $20,000,000; and a relocation of its line at Elkton, Md.

The largest bridge completed during the year was that of the Louisville & Nashville over the Ohio river at Henderson, Ky., approximately two miles long. This structure, which cost $3,748,000, was practically completed at the end of the year. This road also placed in service during the year a new bridge 1,570 ft. long over the Tennessee river at Danville, Tenn.

Work was continued during the year on the Cincinnati Union Terminal, the only large project of its type under way. It is expected that this work will be completed during the spring.

Mileage of Lines Abandoned Increased

There was an increase of 657 miles in the lines abandoned in the United States, the total for the year being 1,452 miles, which is 1,289 miles in excess of the mileage of new lines completed during the year. This is the second largest aggregate abandonment for any year

Lines Abandoned in the United States, Canada and Mexico in 1932

United States	Lines abandoned and taken up Miles	Lines abandoned but not yet taken up Miles
Alton		
Barnett Junction, Ill., to Carlinville		9.94
Carlinville, Ill., to Carrolton		28.19
Atlantic & Danville		
James River Junction, Va., to Claremont Wharf		50.36
Atlantic Coast Line		
At Petersburg, Va.	3.08	
Baltimore & Eastern		
At Vienna, Md.	1.00	
Bonlee & Western		
Bonlee, N. C., to Bennett	10.37	
Boston & Maine		
Whitefield Junction, N. H., to Lancaster		10.47
Bethlehem, N. H., to Fabyans		8.37
Fabyans, N. H., to Base		6.62
Burlington-Rock Island		
Cleburn, Tex., to Hillsboro	29.89	
Central Railway of Arkansas		
Ola Junction, Ark., to Plainview	6.87	
Central of New Jersey		
At Audenreid, Pa.	0.24	
Chattahoochie Valley		
West Point, Ga., to Standing Rock, Ala.		14.32
Chicago, Burlington & Quincy		
Mt. Morris, Ill., to Forreston	11.00	
Keokuk, Iowa, to Mt. Pleasant	34.00	
Fairmont, Neb., to McCool Junction	6.88	
Beatrice, Neb., to Rockford	8.33	
Chicago Great Western		
Gypsum, Iowa, to Lehigh	11.16	
Altura, Minn., to Rollingstone		8.79
Chicago, Milwaukee, St. Paul & Pacific		
Hopkins, Minn., to Lake Minnetonka	7.30	
White Pine Junction, Minn., to White Pine	1.80	
Elkhorn, Wis., to Troy Center		11.48
White Pine Junction, Mich., to Ontonagon		14.50
Chicago, Rock Island & Pacific		
Shaffton, Iowa, to Chancy	7.96	
Trosky, Minn., to Jasper		8.73
Cleveland, Cincinnati, Chicago & St. Louis		
Findlay, Ohio, to Van Lue		9.02
At Findlay, Ohio (Findlay Belt)		0.39
Colorado & Southern		
Crown Mine, Colo., to Boulder	7.65	
Delaware & Hudson		
Johnsonville, N. Y., to Greenwich	14.00	
Denver & Rio Grande Western		
Howard, Colo., to Calcite		5.70
Lascar, Colo., to Cuchara		13.04
Detroit, Toledo & Ironton		
Jeffersonville, Ohio, to Port William		14.30
Erie		
Keystone Branch, Keystone, Pa.	1.20	
Florida East Coast		
Ormond, Fla., to Ormond Beach	1.24	
South Jacksonville, Fla., to Mayport		24.13
Fulton Chain		
Thendara, N. Y., to Old Forge	2.21	
Garyville Northern		
Livingston, La., to Frost		7.00
Frost, La., to Whitehall	9.00	
Whitehall, La., to Garyville		19.00
Georgia & Florida		
Pendleton, Ga., to Graymont		22.70
Gray's Harbor Railway & Light Company		
Aberdeen, Wash., to Cosmopolis	2.86	
Aberdeen, Wash., to Hoquiam		6.39
Great Northern		
Giffen Junction, Mont., to Stockett	1.42	
Lewis Junction, Mont., to Sand Coulee	2.38	
Illinois Central		
Boyle, Miss., to Dockery	7.90	
Moffatt, Tenn., to Troy		4.41
Illinois Terminal		
At Ninth Street, St. Louis, Mo.		0.57
Knox Railroad		
Union, Me.		8.50
Kosciusko & Southeastern		
Kosciusko, Miss., to Zama	16.20	
L'Anguille River		
Marianna, Ark.	1.30	
Leesville, Slagle & Eastern		
Leesville, La., to Slagle	10.35	
Lehigh Valley		
Van Etten, N. Y., to Spencer		1.97
Blackwood Junction, Pa., to Blackwood		5.68
Long Island		
Flushing Creek, L. I., N. Y., to Whitestone Landing	4.14	
Los Angeles & Salt Lake		
Wilson, Utah, to Lucerne	5.02	
Moody, Utah, to Hinckley	3.35	
Louisville & Nashville		
Cliffside, Ky., to West Irvine	76.42	
Maxie, Ky., to Kensee		1.75
Rock Spring, Ala., to Lebd		2.29
Dixiana Junction, Ala., to Dixiana		0.50
Marinette, Tomahawk & Western		
Somo Junction, Wis., to Spirit Falls	13.42	
Marion & Rye Valley		
Marion, Va., to Sugar Grove	17.70	
Michigan Central		
Morgan Park, Mich., to Moscow	39.80	
Frederic, Mich., to Marble		36.30
St. Clair Springs, Mich., to Richmond		14.90
Grayling, Mich., to Lewiston		27.30
Minneapolis & Rainey River		
Deer River, Minn., to Craig	43.00	
Alder, Minn., to Wirt	20.00	
Minneapolis & St. Louis		
Manitou Junction, Minn., to Tonka Bay		1.45
Minneapolis, St. Paul & Sault Ste. Marie		
Rexton, Mich., to Hendricks Quarry		11.90
Morgan & Fentress		
Nemo, Tenn., to Obed Junction		15.50
Mt. Jewett, Kinzua & Ritterville		
Kushequa, Pa., to Smethport	14.60	
New York Central		
Part of Dundee branch, Moscow, Mich.	1.90	
Dundee, Mich., to Moscow		45.04
Ferro, Ohio, to Cannelville		5.52
New York, New Haven & Hartford		
Dedham, Mass., to Islington	1.40	
Hartford & Connecticut Western, Various Lines in Dutchess and Columbia Counties, N. Y.		36.00
Norfolk & Western		
Oehl, Va., to Paint Bank	33.90	
Northern Alabama		
Riverton Junction, Ala., to Riverton		10.87
Oregon Short Line		
Mendon, Utah, to College		2.78
Oregon-Washington Railroad & Navigation Company		
Beaver, Idaho, to Jefferson	8.31	
Bell, Wash., to Amwaco, Idaho	14.21	
Pennsylvania		
Cornwall, Pa., to Ore Banks	0.67	
Carmonia, Pa., to Junction Mine 5		3.06
Deffenbaugh, Ohio, to Lawton		6.20
Pere Marquette		
Grindstone City, Mich., to Port Austin		5.20
Otter Lake, Mich., to Fostoria		5.15
Pigeon River		
West Canton, N. C., to Spruce	11.87	
Pittsburgh, Chartiers & Youghiogheny		
Presto, Pa., to Beechmont		3.28
Borland, Pa., to Beadling		1.02
St. John & Ophir		
St. John, Utah, to Ophir		8.56
St. Louis & Hannibal		
Bowling Green, Mo., to Gilmore	52.60	
San Diego & Arizona		
At Dos Cabezas, Cal.	0.42	
At Titus, Cal.	0.35	
Seaboard Air Line		
Lawrenceville, Ga., to Logansville	11.07	
Ridgewood, Fla., to M. P. 851.48	0.49	
Archer, Fla., to Cedar Key	41.53	
Andrews, S. C., to Lanes	18.95	
St. Marks, Fla., to Smith-Vereen		2.70
Richland, Ga., to Kimbrough		5.80
Sievern & Knoxville		
Batesburg, S. C., to Perry		25.10
Southern		
Moscow, Tenn., to Somerville		13.00
Southern Pacific		
Beaverton, Ore., to Bertha	5.92	
Van Vleck, Tex., to Hawkinsville	17.63	
Sabine, Tex., to south of Taylor's Bayou	10.21	
Gonzales, Tex., to Luling		18.38
Morgan's Point, Tex., to Seabrook		9.86
Sugar Land		
Otey, Tex., to Tigner	10.99	
Tigner, Tex., to House Junction		2.94
Otey, Tex., to Anchor		7.20
Sumpter Valley		
Bates, Ore., to Prairie City		20.00
Tennessee & Carolina Southern		
Maryville, Tenn., to Calderwood	30.50	
Virginia & Southwestern		
Rexford, Tenn., to Buladeen		10.60
Virginia Southern		
Sugar Grove, Va., to Troutdale	7.85	
Wabash		
Clayton, Ill., to Camp Point		5.70
Attica, Ind., to Covington		14.80
Washington & Lincolnton		
Washington, Ga., to Lincolnton	19.68	
Western Maryland		
At Cheat Junction, W. Va., and Spruce		1.36
Total	755.49	696.58
Canada		
Canadian National		
St. Louis, P. Q., to Cecile	4.02	
Grand Mere, P. Q., to East Burrills	4.85	1.63
Aldred, P. Q., to Shawinigan Falls	0.78	1.26
Deseronto, Ont., to Trenton	24.58	
Birch, Ont., to Tay	8.37	
Near Falls Creek, B. C.	0.34	
Operation Discontinued		
Milton Junction, N. S., to Rapid Falls		3.68
Parisville, P. Q., to Deschaillons		3.54
Noyan, P. Q., to St. Hyacinthe		50.04
Trenton, Ont., to Brighton		9.70
St. George, Ont., to Paris Junction		8.00
Jarvis, Ont., to Port Dover		9.09
Burgessville, Ont., to Woodstock		9.21
Hickson, Ont., to Tavistock Junction		6.53
Sand Lake, Ont., to North Lake		14.96
Wardlow, Alta., to Steveville		3.80
Vancouver, Victoria & Eastern Railroad & Navigation Company (Great Northern)		35.40
Total	42.94	156.84
Mexico		
National Railways of Mexico		
Tulancingo to Sotolan	4.16	
Tellez to Pachuca	11.25	
Tellez to Tulancingo	41.27	
Total	56.68	

of record, being exceeded only in 1921 when 1,626 miles were abandoned. This compares with a net decrease of 47 miles of main line in 1931 and of 181 in 1930. In 1929 there was a net increase in main line mileage of 91 miles and of 513 miles in 1928. The largest single abandonment during the year was that of the New York Central and Michigan Central between Dundee, Mich., and Morgan Park, 88 miles. The Louisville & Nashville came second with 76 miles abandoned between Cliffside, Ky., and West Irvine. The largest abandonment of an entire railway was that of the Minneapolis & Rainey River, abandoning its entire line, 63 miles.

Prior to 1917 so little railway mileage had been abandoned in any one year that it had never been considered worth while to keep a record of it. Beginning in that year, however, 942 miles were abandoned and since that time operation has been discontinued on 11,856 miles of main line in the United States, while the new construction has amounted to 10,048 miles, leaving a net decrease for the period of 1,808 miles of main line.

Likewise, in previous years only a negligible amount of main line has been abandoned in any year in Canada. In 1932, however, 81 miles were abandoned permanently and operation was discontinued for the time being on 119 miles, with the prospect that much of this mileage will eventually be abandoned permanently. Mexico also abandoned 57 miles, all of which was on the National railway.

Railway Construction in the United States

Alaska

Important Work Undertaken: Revising grades to eliminate sags, widening embankments and installing ditches, Dunbar, Alaska, to Happy, 29 miles, $147,000 (completed).

Albany Port District Railroad

First Track: At Albany, N. Y., 0.99 miles.
Second Track: At Albany, N. Y., 0.82 miles.
Third Track: At Albany, N. Y., 0.11 miles.
Important Work Undertaken: Additions to general classification yards and tracks to serve grain elevator and water front, Albany, N. Y., $237,000 (completed).

Algers, Winslow & Western

First Track: Oakland City Junction, Ind., and Cato, 1.41 miles.

Atchison, Topeka & Santa Fe

Important Work Undertaken: Subway at Forty-Seventh street and Archer avenue, Chicago, (completed). Viaduct, Storey, Ill., to carry state highway, over tracks (completed). Track elevation and new station facilities, Oklahoma City, Okla. (50 per cent completed). Water supply system, Indian Gardens, Grand Canyon, Ariz. (completed).

Baltimore & Ohio

Important Work Undertaken: Change of line and elevation of tracks through South Philadelphia, Philadelphia, Pa., B. & O. proportion $4,400,000 (89 per cent completed—work suspended temporarily). Reconstruction of tracks to provide a head-on connection for traffic between Potomac yard and Brunswick, Hyattsville, Md., $220,000 (10 per cent completed—work suspended temporarily). Construction of new freight house and team tracks, Silver Spring, Md., $304,515 (30 per cent completed—work suspended temporarily). Constructing enlarged passenger, freight and yard facilities at new location, Johnstown, Pa., $365,000 (30 per cent completed—work suspended temporarily).

Elimination of grade crossing, Second avenue, additional tracks and revision of grades, Pittsburgh, Pa., $555,720 (completed). Separation of grade crossings, Wittmer, Pa., to Mt. Royal, $685,000 (60 per cent completed). Grade separation, East Thornton street, part of Group 2 (joint with Pennsylvania), Akron, Ohio, B. & O. proportion $125,000 (completed). Western Hills viaduct, in connection with Cincinnati Union Terminal, total cost $3,457,000, B. & O. proportion $950,000 (completed). Separation of grades between Second street and Miami river, Dayton, Ohio, B. & O. proportion $2,671,000 (97 per cent completed). Elimination of grade crossing, Blaine, Ohio, B. & O. proportion $105,000 (15 per cent completed). Separation of grades, Joliet road, McCook, Ill., $120,000 (40 per cent completed).

Construction of coal trestle, Twenty-third street, Baltimore, Md., $137,000 (completed). Reconstruction of leased buildings, Pittsburgh, Pa., $116,000 (completed). New connection between Toledo and St. Louis divisions account new union terminal, Winton place, Cincinnati, Ohio, $513,000 (10 per cent completed—work suspended temporarily). Changes in tracks in connection with new union terminal, Cincinnati, Ohio, $787,000 (17 per cent completed). Construction of third and fourth tracks and separation of grades at Clifton and Mitchell avenues, Cincinnati, Ohio, $2,420,000 (6 per cent completed—work deferred temporarily).

(Staten Island Rapid Transit.) Separation of grades, Bay street, Clifton, Staten Island, N. Y., $1,205,000 (completed). Grade crossing elimination South avenue, Arlington, Staten Island, N. Y., $430,000 (completed). Elimination of grade crossings Grasmere to Dongan Hills, Staten Island, N. Y., $1,500,000 (5 per cent completed).

Boston & Maine

Important Work Undertaken: Filling pile trestle, Boston, Mass., $125,000 (15 per cent completed). Elimination of grade crossing with state highway, viaduct, Littleton, Mass., $110,000 (completed). Installation of remote control switches, simplification of track arrangement at West Cambridge and installation of color-light signals, between Boston, Mass., and Waltham, $150,800 (90 per cent completed). Changes and additions to passenger-car repair shops, Concord, N. H., $427,000 (completed).

Canadian National (Lines in U. S.)

Important Work Undertaken: Grade reduction and four-track development M. P. 22.1 to M. P. 27, Pontiac, Mich., to connect with four-track development north of Royal Oak (completion indefinite). Construction of new ferry slips and docks, Muskegon, Mich. (completed).

Carlton & Coast

Important Work Projected: Extension 9.5 miles long in Yamhill co., Ore., to connect with Flora Logging Railroad, $199,000.

Central of New Jersey

Important Work Undertaken: Track elevation to eliminate 19 street crossings and 2 railroad crossings at grade; the abandonment of 1 railroad crossing at grade; and the construction of new interlockings, station and tracks and changing yard tracks, Elizabethport and Perth Amboy branch, Elizabeth, N. J., $1,500,000 (10 per cent completed—work suspended temporarily).

Chesapeake & Ohio

Important Work Undertaken: Enlargement and relining of Lakes tunnel, Backbone, Va., $407,000 (99.5 per cent completed). New single-track tunnel parallel to Lewis tunnel, Jerry's Run, Va., $1,461,000 (88.5 per cent completed). Enlargement and relining of Kelly's tunnel, Jerry's Run, Va., $190,000 (99.5 per cent completed). New single-track tunnel parallel to Alleghany tunnel and relining of a part of Alleghany tunnel, Alleghany, Va., $1,660,000 (90 per cent completed). New double-track tunnel to replace single-track tunnel at Second creek; line revision and new bridge over Greenbriar river, Rockland, W. Va., $1,148,000 (80 per cent completed). New single-track tunnel to parallel Mann's tunnel, Ft. Spring, W. Va., $416,000 (96 per cent completed). New single-track tunnel parallel to tunnel at Big Bend, Talcott, W. Va., $2,471,000 (90 per cent completed). Enlargement of Stretcher's Neck tunnel to accommodate double track and revise grade, Prince, W. Va., $1,124,000 (85 per cent completed). Second track and line revision to eliminate Blue Hole tunnel and convert Pope's Nose tunnel into an open cut, Cotton Hill, W. Va., to Gauley, $1,156,000 (79 per cent completed). Construction of overhead crossing at Winchester avenue, Ashland, Ky., $128,000 (90 per cent completed).

Construction of overhead highway bridge, Walbridge, Ohio, $322,987 (completed). New coal pier, Newport News, Va., $2,210,000 (completed). Waterproofing 21 bridges, Marshall, Ohio, to Columbus, $178,500 (completed). Additional construction on new line subsequent to January 30, 1930, Gregg, Ohio, to Parsons, $283,000 (completed).

Chicago, Burlington & Quincy

Important Work Undertaken: Revision of passenger yard and rearrangement of tracks west of Canal street, Chicago, $1,997,164 (completed). Rearrangement and extension of terminal yard, Galesburg, Ill., $3,000,000 (completed). Erection of through-truss lift span over Illinois river, Oglesby, Ill., $287,672 (75 per cent completed). Rebuilding of coach-repair shop destroyed by fire, Aurora, Ill., $189,000 (completed). Addition to grain elevator, 500,000-bu. capacity, Burlington, Iowa, $105,000 (completed).

Chicago, Milwaukee, St. Paul & Pacific

Important Work Undertaken: Track elevation between Church and Isabella streets, Evanston, Ill., 1.5 miles, $2,000,000 (93 per cent completed). Track elevation, 2.65 miles, track depression, 2 miles, eliminating 14 crossings at grade between Clarke street and North Milwaukee; reduction of grades from 1.1 per cent to 0.65 per cent; and construction of two new freight yards, Northern division, Milwaukee, Wis., $4,000,000 (90 per cent completed).

Chicago Union Station

Important Work Undertaken: Steam generating plant to replace one formerly on the site of the new Chicago postoffice; building and 4 generating units, capacity of each 130,000 lb. of steam per hour, and steam transmission line 4,000 ft. long, Chicago, $1,552,000 (completed).

Cincinnati Union Terminal

Important Work Undertaken: Construction of Union passenger terminal, Cincinnati, Ohio, $41,000,000 (94 per cent completed).

Colorado & Southern

First Track: (Ft. Worth & Denver Northern.) Childress, Tex., to Pampa, 110.07 miles. Elfco, Tex., to Texas Elf Carbon Plant, 3.53 miles

Delaware & Hudson

Important Work Undertaken: Separation of grades at eight street crossings, Albany, N. Y., $1,000,000 (80 per cent completed). Separation of grades at four streets, Whitehall, N. Y., $800,000 (85 per cent completed).

Delaware, Lackawanna & Western

Important Work Undertaken: Construction of two reinforced concrete bridges over new state highway to separate grades, Hampton, N. J. (completed). Construction of new highway 1,600 ft. long and of a reinforced concrete viaduct and a pedestrian subway, to eliminate a grade crossing, New Providence, N. J. (completed). Construction of undercrossing to eliminate grade crossing, Liberty street, Binghamton, N. Y.—joint with Erie and Delaware & Hudson (completed). Track elevation to eliminate grade crossings at 11 streets; alterations to track arrangement and passenger station, Elmira, N. Y. (completed). Elimination of grade crossings at Austin, Tonawanda, Hamilton, Gorton, Amherst, Thompson and Parish streets, Black Rock, Buffalo, N. Y. (completed).

Denver & Rio Grande Western

New Line Under Construction: (Denver & Salt Lake Western.) Dotsero, Colo., and Orestod, 38.71 miles, $3,850,000 (started).

Detroit, Toledo & Ironton

Important Work Undertaken: Grade crossing elimination, Outer drive, Allen Park, Mich., $175,000 (completed).

Erie

Important Work Undertaken: Elimination of two grade crossings, Hornell, N. Y. (completed). Elimination of grade crossing, Erwins, N. Y. (completed). Relocation and elimination of grade crossing, Passaic avenue, West Arlington, N. J. (completed). New highway bridge to replace existing bridge, Tonnelle avenue, Jersey City, N. J. (completed). Construction of viaduct to separate grades with state highway, Englewood, N. J. (completed). Elimination of grade crossing, Starin avenue, Buffalo, N. Y. (completed). Grade separation with highway, Hillburn, N. Y. (completed). Grade crossing elimination, Liberty street, Binghamton, N. Y., joint with D., L. & W. and D. & H. (completed). Elimination of five grade crossings, Black Rock, Buffalo, N. Y. (85 per cent completed). General track elevation, Elmira, N. Y., Stage 1, construction of new engine terminal facilities and construction of a temporary trestle across the Chemung river preparatory to raising the existing bridge to the new grade (completed). Separation of grades by relocating street and constructing overhead bridge, Wildwood avenue, Salamanca, N. Y. (80 per cent completed).

Great Northern

First Track: Bend, Ore., to Lava, 13.84 miles.

Hoover Dam

First Track: Rim of Colorado river to site of Hoover Dam, 20 miles.

Illinois Central

Important Work Undertaken: Replacement of swing draw spans with a 150-ft. bascule-lift span, over Green river, Rockport, Ky., $339,600 (completed). Replacing draw span and one fixed span with three fixed spans, over Salt river, West Point, Ky., $200,000 (80 per cent completed). Replacing present draw and two fixed spans by fixed spans with sheer boom to provide a wider channel, over Illinois river, La Salle, Ill., $431,000 (40 per cent completed).

Illinois Terminal

First Track: In St. Louis, Mo., 0.67 mile.
Second Track: In St. Louis, Mo., 0.48 mile.
Important Work Undertaken: Construction of double track subway under Twelfth Street boulevard, from Cass avenue to Washington avenue, and construction of terminal freight and passenger facilities, St. Louis, Mo., $4,000,000 (completed).

Indianapolis Union Railway

Important Work Undertaken: Relocation of locomotive repair shop, elevation of tracks to eliminate 23 street and 4 railway crossings at grade, construction of 5-track bridge 800 ft. long over White river and construction of new classification yard, Indianapolis, Ind., $13,000,000 (22 per cent completed—work suspended temporarily).

Kansas City Terminal

Important Work Undertaken: Enlargement of sub-basement of Union station and installation of conveyor system, new elevators, etc., to improve mail-handling facilities, Kansas City, Mo., $525,000 (50 per cent completed).

Lehigh Valley

Important Work Undertaken: New bridge over state highway Route 29, Newark, N. J. (completed). Elimination of grade crossings, Van Etten, N. Y. (50 per cent completed). Separation of grades, Decker's crossing, Cayuga, N. Y. (completed). Separation of grades, Horton's crossing, joint with Erie, Tioga Center, N. Y. (50 per cent completed).

Long Island

Important Work Undertaken: Track elevation, partly on embankment and partly on viaduct, to eliminate 8 existing crossings and one new highway at grade, Valley Stream, L. I., N. Y., $3,000,000 (30 per cent completed). Elimination of grade crossing with new highway, Linden boulevard, Brooklyn, N. Y., $154,000 (completed). Elimination of Carleton avenue grade crossing, East Islip, L. I., N. Y., $200,000 (completed). Additional substations and equipment, and transmission lines at various points, $1,466,300 (completed).

Louisville & Nashville

Important Work Undertaken: Track elevation to eliminate four grade crossings, rearrangement of tracks, buildings, signals, etc., Birmingham, Ala., $4,000,000 (98 per cent completed). Reconstruction of bridge, including draw span, over Tennessee river, Danville, Tenn., $800,000 (completed). New bridge 9,882 ft. long, over Ohio river, including undercrossings at four streets, Henderson, Ky., $3,748,000 (98 per cent completed).

Marianna & Blountstown

New Line Projected: Marianna, Fla., to Greenwood, 9 miles. (Alabama, Florida & Gulf.) Wilson, Ala., to Dothan, 5 miles.

Missouri-Kansas-Texas

Important Work Undertaken: Construction of new bridge and removal of old structure over Missouri river, Boonville, Mo., $1,000,000 (completed). Grade separation, Corinth street, Dallas, Tex., joint with three other roads, $200,000, M-K-T proportion $35,000 (completed). Grade separation, Lamar and McKinney streets, Dallas, Tex., $200,000, joint with other roads and city, M-K-T proportion $87,000 (40 per cent completed).

Missouri Pacific

First Track: At Cape Girardeau, Mo., 0.12 mile. At Barton Crossing, Ark., 0.12 mile.
Important Work Undertaken: Replacing three-track concrete arch with steel spans, to accommodate new channel of River des Peres, enlarged and straightened by city of St. Louis, St. Louis, Mo., $353,000 (completed). Reconstruction of bridge No. 85, Medina, Ark., $148,000 (completed). Filling part of north approach and renewing remainder, bridge No. 83, Benzal, Ark., $292,000 (completed). Reconstruction of bridge No. 140, Cricket, Ark., $90,000 (completed). Reconstruction of bridge No. 146, Myrtle, Ark., $100,000 (completed). Reconstruction of bridge No. 148, Myrtle, Ark., $100,000 (40 per cent completed). Rehabilitation of line Riley Lake, Ill., to Raddle Junction, Ill., $336,000 (completed). Construction of concrete workhouse, 326,000-bu. capacity, Missouri elevator, Kansas City, Mo., $796,000 (completed).

New Orleans Public Belt

Important Work Projected: Construction of a combined railway and highway bridge over the Mississippi river, together with the necessary trackage and connections, New Orleans, La., $13,000,000.

New York Central

Important Work Undertaken: Strengthening retaining wall at 138th street, New York, $100,000 (completed). Construction of undercrossing, 233rd street, New York, $349,000 (98 per cent completed). Foundations for St. John's Park freight terminal, Charlton to Clarkson streets, New York, $2,550,000 (completed). Elevated track structure, Clarkson street to West 30th street, New York, $4,157,000 (50 per cent completed). Storage warehouse and elevated track structure at 14th street, New York, $700,000 (completed). Elevated loop track structure, 30th street yard, New York, $1,650,000 (80 per cent completed). Alterations to piers and construction of bulkhead, Piers B to F, 60th street yard, New York, $800,000 (75 per cent completed). Construction of city sewer west of Riverside drive, 72nd street, New York, $220,000 (completed). Relocation of city sewers from 33rd street to 59th street, New York, $1,000,000 (60 per cent completed). Reconstruction of yard at 30th street, New York, $615,000 (completed). Reconstruction of yard at 60th street, New York, $331,000 (completed). Track and signal changes, Ossining, N. Y., to Oscawana, $900,000 (30 per cent completed). Construction of warehouse and cold storage building 802-816 Washington street, New York, $500,000 (10 per cent completed).

Grade separation, Tarrytown road, Valhalla, N. Y., $179,400 (completed). Elimination of grade crossings at Storm King and Breakneck crossings, Storm King, N. Y., $457,700 (completed). Grade separation, Albion street, Holley, N. Y., $163,700 (completed). Reconstruction of bridge No. 594, East Syracuse, N. Y., $230,300 (completed). Reconstruction of West Street yard, Syracuse, N. Y., $206,000 (completed). Elimination of grade crossing with state highway No. 5334-A, Reading Center, N. Y., $109,700 (completed). Reconstruction of bridge No. 431, Ft. Plain, N. Y., $105,600 (completed). Track elevation to eliminate grade crossings, Amherst to Austin streets, Black Rock, Buffalo, N. Y., $1,559,200 (completed). Installation of equipment for precooling passenger cars at terminals, Chicago, Buffalo, Detroit, Indianapolis, St. Louis, Cincinnati, Cleveland and New York, $233,000 (completed).

Overhead bridge to eliminate grade crossing, Telegraph road, Elyria, Ohio (completed). Track elevation to eliminate grade crossings at Division, Cherry and Walnut streets, South Bend, Ind., $859,000 (4 per cent completed).

(Cleveland, Cincinnati, Chicago & St. Louis.) Terminal improvements, additional yards, engine terminal, grade separation and electrification of westerly approach to Cleveland Union Terminal, Cleveland, Ohio, $6,750,000 (99 per cent completed). Track elevation to eliminate grade crossings at three streets, Carthage, Cincinnati, Ohio, $1,357,000 (5 per cent completed).

(Indiana Harbor Belt.) Separation of grades, Ogden avenue, LaGrange, Ill., I. H. B. proportion $152,000 (completed). Construction of tunnel under Little Calumet river for water mains and construction of pipe line from this tunnel to Blue Island yard, Riverdale, Ill., $125,000 (completed).

(Pittsburgh & Lake Erie.) Facilities for transferring freight between river and rail, Colona, Pa., $450,000 (completed).

New York, Chicago & St. Louis

Important Work Undertaken: Change in alinement, construction of new yard and interchange tracks, several grade separations and installation of signals, Toledo, Ohio, to Maumee, $1,299,150 (completed). Grading for extension of One Hundred Third-street yard, Chicago, $100,000 (completed).

New York, New Haven & Hartford

Important Work Undertaken: Grade separation, Modena, Town of Plattekill, N. Y., $162,000 (75 per cent completed). Elimination of grade crossing and improved station facilities, Quincy, Mass., N. Y., N. H. & H. proportion $705,000 (40 per cent completed—work deferred). Track changes and signal installation, Braintree, Mass., to Middleboro, $224,300 (4 per cent completed). Elimination of grade crossing and changes in freight house, Thomaston, Conn., $216,000 (85 per cent completed).

Norfolk & Western

Important Work Undertaken: Acquisition of land and construction of team tracks, Norfolk, Va., $146,000 (completed). Strengthening 19 bridges on North Carolina extension, $692,000 (completed). Grade separation, Refugee road, Columbus, Ohio, $113,750 (completed).

Northern Pacific

Important Work Undertaken: New engine terminal facilities, because of transfer from Ellensburg, Wash., Yakima, Wash., $225,000 (completed). Bridge over west waterway, Duwomish river, Seattle, Wash., $324,000 (completed).

Pennsylvania

First Track: At Washington, D. C., 1.14 miles.
Third Track: Gwynns Falls, Md., to Loudon Park, 1.25 miles.
Fourth Track: Gwynns Falls, Md., to Loudon Park, 1.25 miles.
Important Work Undertaken: Track changes, platform extensions, relocation of columns and underground facilities to permit extension to New York postoffice and the construction of additional mail-handling facilities, Pennsylvania station, New York, $420,500 (80 per cent completed). New station and express buildings, construction of 3 new bridges over Passaic river, additional tracks and track elevation, Newark, N. J., $25,000,000 (15 per cent completed).

Separation of grades, Plainfield avenue, Stelton, N. J., $112,000 (completed). Removal of pivot and fender piers and timber fenders between fender piers, Delaware river, south of Trenton, N. J., $100,000 (completed). Construction of single-leaf bascule bridge to replace retractile bridge carrying state highway over canal, Baker's Basin, N. J., $200,000 (completed). Construction of steel and concrete viaduct 1,300 ft. long to separate grades with state highway, Newark, N. J., $360,000 (5 per cent completed). New station plaza and approach and extension of overhead bridge to approach, Trenton, N. J., $125,000 (60 per cent completed). Facilities for handling electric locomotives, Sunnyside Yard, Long Island City, L. I., N. Y., $100,000 (25 per cent completed). Electrification of main line Jersey City, N. J., to New Brunswick, $10,720,000 (completed). Electrification of main line New Brunswick, N. J., to Trenton, $6,560,000 (89.5 per cent completed). Electrification of freight lines, Greenville, Waverly, Passaic, Harsimus, Meadows and South Amboy

branches, all in New Jersey, $8,626,000 (10 per cent completed). Through power supply, Trenton, N. J., to Liddonfield, Pa., $956,000 (67 per cent completed).

Construction of container yard, Enola, Pa., $130,000 (completed). Relocation and elevation of tracks to eliminate grade crossings, Norristown, Pa., $705,000 (10 per cent completed). Change of line, Elkton, Md., $1,505,000 (25 per cent completed). Relocation of tracks to eliminate two grade crossings, Liverpool, Pa., $260,000 (completed). Construction of Bolton coal yard, Baltimore, Md., $185,000 (completed). Extension of siding to Buzzard's Point, Washington, D. C., $130,000 (completed). Philadelphia improvements, including new facilities for through and suburban passenger trains, rearrangement of tracks, yards and engine facilities, Philadelphia, Pa., $60,000,000 (85 per cent completed). New line through Baltimore, Baltimore improvements, Baltimore, Md., $20,000,000 (20 per cent completed). Electrification of main line Wilmington, Del., to Washington, D. C., $38,485,000 (10 per cent completed). Through power supply, Liddonfield, Pa., to Wilmington, Del., $8,068,000 (67 per cent completed).

Overhead bridge and lateral highway to eliminate 3 grade crossings between Panama, N. Y., and Sherman, $120,000 (completed). Reconstruction of bridges at Main and Steuben streets, Pittsburgh, Pa., for Allegheny county, $403,000 (completed). Rail to river transfer facilities, Baden, Pa., $354,000 (25 per cent completed—work suspended temporarily). Elimination of grade crossing, Main street, Niles, Ohio, $650,000 (15 per cent completed).

Track elevation and construction of second track, Englewood Connecting Railway, 2.4 miles, Chicago, $2,500,000 (45 per cent completed). Connections at Red Bank and Norwood to reach new Union station, Cincinnati, Ohio, $1,225,000 (95 per cent completed). Relocation of line and elevation of tracks, Dayton, Ohio, $5,175,000 (95 per cent completed).

Pere Marquette

Important Work Undertaken: Rebuilding and improving ferry slip and apron, Windsor, Ont., $180,000 (80 per cent completed).

Port of New York Authority

Important Work Undertaken: Construction of a union inland l.c.l. freight terminal station to serve all roads entering New York, between Eighth and Ninth avenues and Fifteenth and Sixteenth streets, New York, $16,000,000 (completed).

Reading

Important Work Undertaken: Construction of new passenger station, Jenkintown, Pa., $130,000 (completed). Construction of independent passenger and freight stations, including platforms, platform shelters, paving, etc., Royersford, Pa., $138,000 (completed). Construction of new passenger and freight stations and incidental facilities; also lowering tracks account change of grade, Chestnut Hill, Pa., $211,000 (95 per cent completed). Reconstruction of outshore end of Pier 11, Port Richmond, Philadelphia, Pa., $160,000 (completed). Reconditioning Pier 1, Port Reading, N. J., $134,000 (completed).

Elevation of tracks to eliminate grade crossings, construction of new freight and passenger station facilities, Norristown, Pa., $707,000 (completed). Track elevation from south of Wister street to Haines street and from Sedgwick street to Gravers lane; new passenger and freight stations and incidental facilities at Germantown and new passenger station at Wister, Chestnut Hill grade crossing elimination, Philadelphia, Pa., to Germantown, $3,023,315 (80 per cent completed). Electrification of Philadelphia suburban lines, Wayne Junction to Chestnut Hill, Philadelphia, Pa., 4.8 miles, $472,000 (95 per cent completed). Electrification of suburban lines, Sixteenth Street Junction, Philadelphia, Pa., to Norristown, 14.7 miles, $839,000 (completed).

Richmond, Fredericksburg & Potomac

Important Work Undertaken: Grade separation, Lombardy street, Richmond, Va. (completed).

St. Louis-San Francisco

Important Work Undertaken: New bridge to cross River des Peres and Wellington Avenue improvement of River des Peres by city, St. Louis, Mo., $300,000 (20 per cent completed). Grade separation, Summit avenue, at crossing with Texas & Pacific, Fort Worth, Tex., $145,000 (20 per cent completed).

San Diego & Arizona

First Track: Dos Cabezas, Cal., 0.44 mile. Titus, Cal., 0.43 mile.

Important Work Undertaken: Reline 1,250 ft. of tunnel No. 3, destroyed by fire, Lindero, Mexico, $119,000 (completed). Change of line made necessary by landslide which destroyed east end of tunnel No. 15; work included timber bridge 622 ft. long and 170 ft. high, and new tunnel 177 ft. long, Carriso Gorge, Cal., $152,000 (completed). Revision of alinement to permit abandonment of tunnel No. 7, lining of which was destroyed by fire, Carriso Gorge, Cal. (completed).

Southern

Important Work Undertaken: Grade separation, 14th, 18th, 20th and 22nd streets, Birmingham, Ala., $738,000 (completed). Reconstruction of part of bridge over Savannah river, Augusta, Ga., $250,000 (completed).

Southern Pacific

Important Work Undertaken: (Pacific Lines.) Installation of heating facilities at various fuel-oil stations and in locomotive tenders, to permit use of heavy residuum fuel oil, $600,000 (80 per cent completed). Reinforcement of Canada Honda and Los Alamos creek viaducts to bring capacity to Cooper's E-70 loading, Honda, Cal., and Narlin, $215,000 (95 per cent completed).

(Texas and Louisiana Lines.) Construction of drawbridge over Harvey canal, and necessary trackage, Harvey, La., $325,000 (35 per cent completed). Produce terminal warehouse development, New Orleans, La., $453,000 (65 per cent completed—work deferred). Construction of 7-mile extension to industrial spur to reach Ashland refinery, Waggaman, La., $240,000 (completed). Replacing 5 steel spans over Devil's river with 7 steel spans totaling 900 ft., Devil's river, Tex., $200,000 (80 per cent completed).

Terminal Railroad Association of St. Louis

Important Work Undertaken: Construction of north approach to municipal bridge over Mississippi river, East St. Louis, Ill., $1,720,000 (80 per cent completed).

Texas & Pacific

Important Work Undertaken: Grade separation, Summit avenue, Ft. Worth, Tex., $100,000 (15 per cent completed). Grade revision west of Henderson street, Ft. Worth, Tex., $100,000 (completed).

Texas Pacific-Missouri Pacific Terminal Railroad of New Orleans

Important Work Undertaken: Construction of bascule-lift bridge over intracoastal canal, Harvey, La., $350,000 (35 per cent completed).

Union Pacific

First Track: (Los Angeles & Salt Lake.) Rioco, Cal., to Wilmington, 8.50 miles.

Important Work Undertaken: Replacing 9 pile piers with concrete, bridge No. 2.10, west of Valley, Neb., $108,000 (completed).

(Oregon-Washington Railroad & Navigation Company.) Purchase of land, grading and construction of 1,000 ft. of track to provide for industrial development, Seattle, Wash., $259,917 (80 per cent completed).

(Los Angeles & Salt Lake.) Enlargement to double track section and lining with concrete, tunnel No. 4, Kyle, Nev., $502,500 (completed). Construction of reinforced concrete viaduct 3,173 ft. long over Los Angeles river, and the tracks of the Atchison, Topeka & Santa Fe and the Los Angeles & Salt Lake, to eliminate grade crossings, Los Angeles, Cal., L. A. & S. L. proportion $520,000 (completed). Construction of subway at Washington boulevard, Los Angeles, Cal., to replace grade crossing at Spence street, $142,000 (completed). Construction of steel and concrete bridge 1,049 ft. long to replace 19-span trestle, over Los Angeles County flood-control channel, Workman, Cal., $289,700 (completed).

Virginian

New Road Under Construction: From M. P. 33 on Guyandot river line to Gilbert, W. Va., 11.4 miles.

Western Maryland

First Track: At Cheat Junction, W. Va., 1.08 miles. At Spruce, W. Va., 0.72 mile.

Second Track: At Spruce, W. Va., 0.91 mile.

Railway Construction in Canada

Canadian Pacific

First Track: Dunelm, Sask., southwesterly, 25.2 miles. Hamlin, Sask., to Shellbrook, 26.4 miles (track laid but not in operation). Medstead, Sask., northeasterly, 36 miles (track completed but not in operation). Prince Albert, Sask., to Lac la Biche, 94.4 miles (track laid and second ballast lift completed, but not in operation). Rosetown, Sask., southeasterly, 17.6 miles. Vanguard, Sask., to Meyronne, 31.5 miles (track laid but not yet ballasted). Tuffnell, Sask., to Prince Albert, 72.9 miles. Bulwark, Alta., to Berkinshaw, 14.5 miles (track laid but not in operation). Coronation, Alta., to Youngstown, 39.6 miles (track completed but not in operation).

Important Work Undertaken: Extension to station, new power plant, coach yard and incidental facilities, Regina, Sask., $1,240,000 (completed). Tunnel to connect main line with False Creek yard, Vancouver, B. C., $500,000 (completed).

Canadian National

First Track: St. Louis, P. Q., to Cecile, 4.47 miles. Near Falls Creek, B. C., 0.34 mile.

Important Work Undertaken: Construction of storage and lead tracks to Pier B, Halifax, N. S. (to be completed in 1933). Construction of new passenger station, St. John, N. B. (to be completed in 1933). Separation of grades, London, Ont. (to be completed in 1933). Diversion of Sixth Line road and construction of subway at Seventh Line road, Oakville, Ont. (to be completed in 1933). Separation of grades, Austin to Amherst streets, Black Rock, Buffalo, N. Y. (completed). Construction of new hotel, capacity 250 rooms, Saskatoon, Sask. (completion indefinite). Construction of new hotel, capacity 595 rooms, Vancouver, B. C. (completion indefinite). Construction of sewer in False Creek area, Vancouver, B. C. (completion indefinite).

Reconstruction of Bridge M. 133.2 over Taunton Creek, Calgary division, Alta. (completed). Replacement of timber crib piers with concrete, Bridge M. 59.1 over Thompson river, Kamloops division, B. C. (completed). Construction of wharf and freight shed, Port Arthur, Ont. (completed). Lining tunnel M. 54.9 with concrete, Ashcroft subdivision, Kamloops division, B. C. (completed).

Toronto, Hamilton & Buffalo

Important Work Undertaken: Grade separations between east portal of tunnel and Victoria avenue, including Canadian National, Hamilton, Ont. (88 per cent completed). Construction of new passenger station, Hamilton, Ont. (work under contract).

Railway Construction in Mexico

National Railways of Mexico

First Track: Tellez to Soledad, 4.14 miles.

Important Work Undertaken: Mexico-Tampico Short Line, 333.7 miles (23 per cent completed, 50.2 miles in operation—work suspended for the present). Gulf Coast Line, Tampico to Vera Cruz, 312.8 miles (16.7 per cent completed, 48 miles in operation—work suspended for the present).

(Changes from narrow gage to standard gage.) El Rey to Beristain, 66.07 miles (completed). San Augustin to San Lorenzo, 23.49 miles (completed). Tepa to Pachuca, 16.04 miles (completed). Ventoquipa to Tulancingo, 5.03 miles (completed). Sototlan to Apulco, 12.06 miles (completed).

Important Work Projected: (New lines authorized.) Empalme del Oro to Sierra Mojada. San Carlos to Villa Acuña. El Salto to Mazatlan (Durango to Mazatlan extension).

(New lines under survey.) Soledad to Puerto de Tuxpan (location surveys completed). Aristeo to Apatzingan (location surveys completed). Tula-Pachuca connection, 2.18 miles (location surveys completed).

(New lines projected.) Sierra Mojada to Jimenez. Zacatecas and Berriozabal to La Honda. Rosario to Inde. Inde to Descubridora. Inde to Tepehuanes. Tepehuanes to Guanacevi. Puerto Mexico and Sta. Lucrecia to Campeche. Balsas to Acapulco. Tehuacan and Tezonapa to Rio Blanco. Balsas to Zihuatanejo. Coapa to Coyuca. Ejutla to Puerto Angel. Tlacolula to Tehuantepec.

The Worst Results in History Mark

RAILWAY FINANCES IN 1932

By J. G. Lyne
Financial Editor,
Railway Age

Trend, however, has been moderately upward since July—Roads fail by 200 millions to earn fixed charges

THE year 1932 was the first since the depression in which the financial performance of the railways offered definite grounds for the assumption that the worst of the storm had passed and that the future trend would be toward better times. Throughout 1930, 1931 and the first half of 1932, traffic, earnings and security prices fell steadily, with only minor upturns of short duration to break their precipitate decline. In July, 1932, however, there began to appear some evidences of improvement which were reflected in security prices. This improvement continued in respect to bonds throughout August and, in stocks, through September. Thereafter there was some recession, but both stock and bond prices "bumped along" during the last quarter of the year, without sharp fluctuations, at prices considerably above the June lows. Thus we have, for the first similar period since the depression, a half-year at the end of which security prices were higher than they were at the beginning. On nothing else, probably, short of general evidence on all sides of rapid improvement in business, could hopes for a better 1933 and a still better 1934 be more soundly based.

The relative improvement in traffic during the latter half of the year was reflected in the trend of freight car loading. In the first eight months of 1932, the total was 28 per cent less than for the same period in 1931. In the last four months of the year the decline was but 17 per cent under the same period in 1931. In December the decrease was only 9 per cent. On the basis of this trend it is freely predicted that the total loadings for the first quarter of 1933 will be but slightly under those for that period last year, and it seems not unlikely that the second quarter may show an increase over that period in 1932.

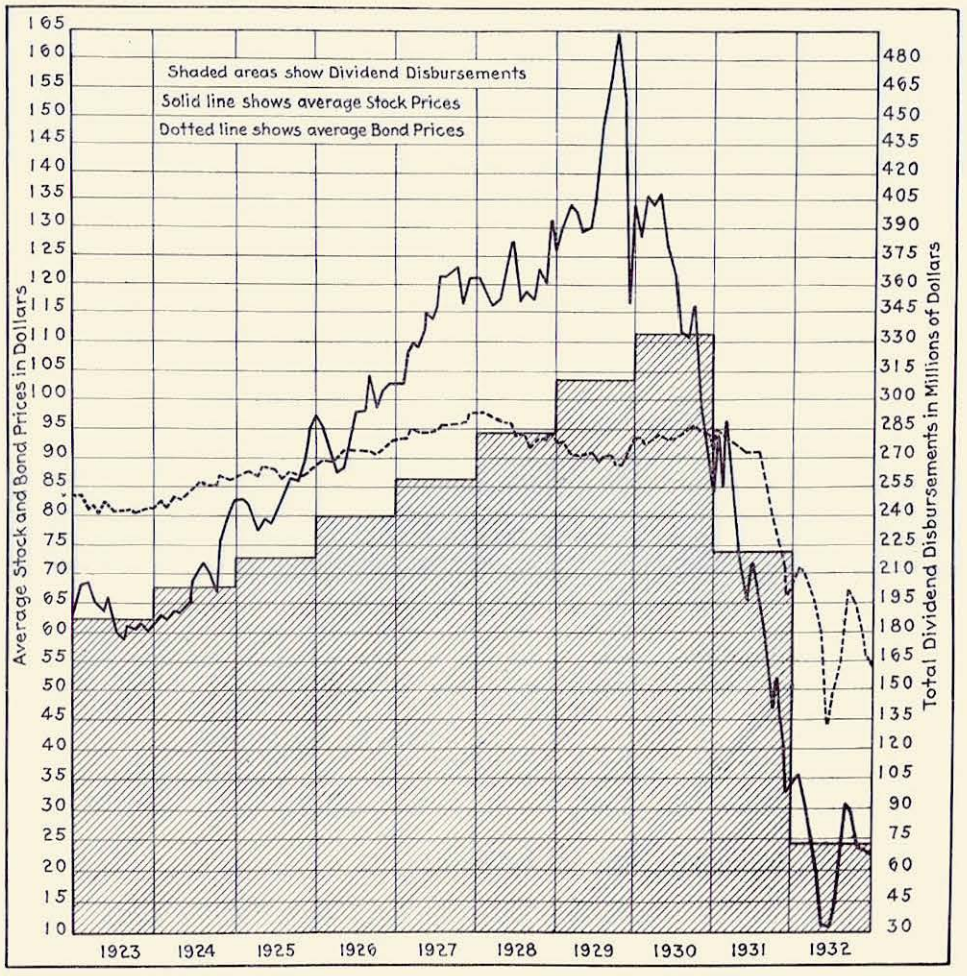


Chart A—Average Prices of Stocks and Bonds of Twenty Leading Railroads, With Dividend Disbursements Shown on Same Relative Scale

1932 Dividend Payments Estimated.

Even more encouraging than the end to the decline in traffic has been the extent to which the railways have been able to avoid increases in their expenses consonant with better revenues. In the first eight months of 1932 net railway operating income totaled only $152,300,000, or about 19 millions a month. In September it was $49,647,000, in October, $63,840,000 and in November, $34,000,000. Necessity being the mother of invention, the railways in 1932 learned lessons of economy which should enable them to return to a level of relative prosperity with gross revenues

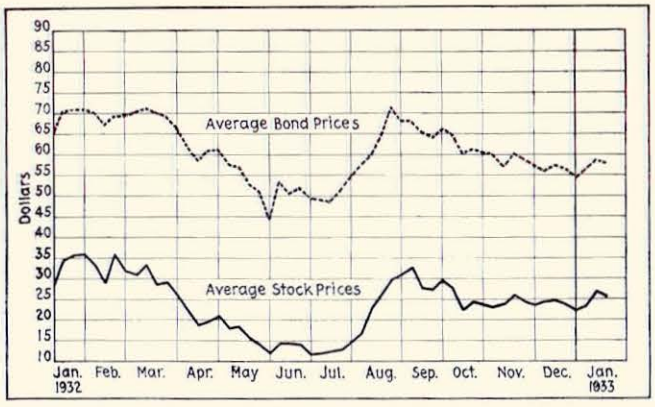


Chart B—Fluctuations in the Average Price of Twenty Leading Railroad Stocks and Twenty Leading Railroad Bonds in 1932 and First Three Weeks of 1933

totaling considerably less than those attained in 1929.

With these indications pointing to better times to come, however, the railway financial situation is, in all conscience, sufficiently serious to give deep concern to every intelligent citizen. The roads have just gone through the worst year in their history—the depression following the panic of 'Ninety-three being almost "good times" by comparison. (In 1932 the railways failed to earn their fixed charges by 200 millions, whereas in each of the two years of the depression in the 'Nineties they earned 60 millions over fixed charges, with total investment in their properties less than one-third as great as it was in 1932.) The major railway systems which in 1932, after paying all their operating expenses and meeting the demands of the ever-more-voracious tax-gatherer, still had enough of their earnings left to pay all their interest obligations, could be counted, almost, on the fingers. Moreover, a tremendous liability in the form of undermaintenance is being piled up.

The trend during the year of railway security prices (average of 20 leading stocks and an equal number of bonds) as computed by the *Railway Age*, are shown in Chart B. The trend of these same prices during the past decade is portrayed in Chart A, which likewise shows, plotted on the same relative scale, the dividend disbursements of the companies the stocks of which are included in the average. Chart B gives striking proof of the betterment since mid-year while Chart A shows, even more dramatically, the catastrophic decline since 1929 which has more than obliterated the improvement made step by step until that year.

Rails and Industrials Change Places in Public Favor

The depression, as reflected in stock prices, has been much more severe on the railways than in other industry. This is shown by the Dow-Jones compilation of average prices of railroad and industrial stocks for the years since 1897. Industrial shares started that year at an average price of 40.74 and railroads at 51.71. In the depression year of 1907 industrial stocks sagged to 56.85, and the railways only to 86.61. In 1921 industrial stocks fell to 78.12 and the railways to 73.30. But in July, 1932, when railroad stocks declined to 13.23 on the Dow-Jones scale, the lowest in history, industrials touched a bottom of 41.22—more than three times the railroad average, and actually slightly greater than the average of 40.74 with which the Dow-Jones industrial averages started in 1897.

The 1932 low for railroad stocks, by comparison, was only a little more than one-fourth as great as the average price at the beginning of 1897. The reason for this disparity is, of course the fact that industry in general has not been subjected, as the railways have been, to progressive encirclement by governmental regulation and to vigorous competition supported by the public treasury. Prior to the adoption of this treatment of the railways as a definite governmental policy, railroad stocks always averaged more in price than those of industrial companies. Since that time their stock prices have been constantly lower than those of untrammeled industry.

Table I—Comparison of Dividends and Taxes, 1911 to 1931

Year Ended June 30	Dividends *	Proportion of Net Income Paid in Dividends	Taxes *
1911	$397,068,724	81	$98,626,848
1912	339,964,855	85	109,445,407
1913	322,300,406	66	118,386,859
1914	376,098,785	108	135,572,579
1915	259,809,520	82	133,276,330
1916	281,936,371	47	145,517,034
Year Ended December 31			
1916	306,176,937	47	157,113,372
1917	320,395,779	53	213,920,095
1918	275,336,547	71	223,175,379
1919	278,516,908	62.5	232,601,397
1920	271,731,669	63	272,061,453
1921	298,511,328	95	275,875,990
1922	271,573,751	73	301,034,923
1923	296,127,048	53	331,915,459
1924	320,429,767	57	340,336,686
1925	342,020,885	49	358,516,046
1926	399,243,963	49	388,922,856
1927	411,581,093	61	376,110,259
1928	430,677,138	55	389,432,415
1929	490,125,673	55	396,682,634
1930	497,024,912‡	95	348,553,953
1931	330,150,873	245	303,528,099

* Not including switching and terminal companies.
‡ Excludes stock dividend of $9,600,000.

Corporate Financing on Wane

In the railways, it may well be that the entire system of corporate financing is on trial. Private corporations, in selling their securities to the investing public, can offer in exchange only a mortgage on their own capital assets or a claim on their earnings. Government financing is carried on in competition with corporate financing, making a bid for the same investment capital that private corporations seek. Government obligations, however, resting as they do on taxation, constitute a lien on corporate property and income which takes precedence over the claims of its own creditors and owners. Furthermore, owners of corporate securities are taxed on their

Table II—Railway Securities Sold to Public in 1916 and 1920 to 1932

Year	Bonds	Notes	Stock	Total R.R. financing	Total all financing	Per cent R.R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.90
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.12
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.64
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.22
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.04
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.46
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.63
1926	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.94
1927	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.61
1928	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
1931	453,824,000	105,209,000	.....	559,033,000	2,730,082,000	20.5
1932	11,827,000	13,125,000	.....	24,952,000	684,806,000	2.5

incomes from such holdings whereas those of many government obligations are not.

The unnatural advantages enjoyed by government securities in competing for investors' patronage make it possible for corporate securities to hold their own and

Table III—Receiverships Established in 1932

Name of Road	Mileage	Funded debt outstanding	Capital stock outstanding
Apalachicola Northern	99	$2,000,000	$1,000,000
Central of Georgia	1,944	53,722,000	20,000,000
Cowlitz, Chehalis & Cascade	32	800,883	425,000
Franklin & Pittsylvania	21	none	30,100
Minnesota Western	115	672,000	1,440,238
Mobile & Ohio	1,153	32,169,500	6,016,800
New Orleans Great Northern	265	8,248,000	7,500,000
Norfolk Southern	933	15,401,000	16,000,000
St. Louis-San Francisco	5,890	268,178,767	114,701,326
Sierra Railway Company of California	79	1,747,000	3,248,000
Sievern & Knoxville	26	(no information obtainable)	
Tonopah & Goldfield	102	none	1,051,500
Wisconsin Central	1,158	44,833,000	27,392,200
Total thirteen companies	11,817	$427,772,150	$198,805,164

secure a reasonable share of available investment capital only if governmental borrowing is done with a reasonable amount of restraint. Corporate financing cannot but fail if government borrowing is done on a sufficiently large scale to make of the prior claim of the tax-gatherer on the assets and earnings of the corporations a definite menace to the claims of the corporations' creditors and owners. Total figures of railroad taxation for 1932 are not available but it probably exceeded by at least 75 millions the sum by which the railroads failed to earn their fixed charges.

Government Competition for Investment Funds

Thus it was that governmental financing flourished, and railroad financing all but disappeared, in 1932. But governmental destruction of corporate credit has not stopped, in the case of the railroads, merely at exactions so heavy that nothing remains for their creditors and owners. It has gone farther, and has used the money it has borrowed and exacted in taxes from the railroads and other taxpayers to provide transport facilities by highway, waterway and air that private capital, unaided, would not, and could not afford, to provide. The government has thus attracted traffic unnaturally and uneconomically from the railways to these competing forms

Table IV—Foreclosure Sales in 1932

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding
Colorado-Kansas (a)	23	$379,850	$500,000
Hoboken Manufacturers Railroad	11	none	400,000
Maryland & Delaware Coast	39	189,000	none
Minnesota Western	115	672,000	1,440,238
Mound City & Eastern	18	none	none
Murfreesboro-Nashville Southwestern	15	25,000	16,000
Ulster & Delaware (b)	129	3,000,000	1,900,000
Wiscasset, Waterville & Farmington (c)	44	none	53,090
Total eight companies	394	$4,265,850	$4,309,328

(a) Sold at a trustee's sale subject to approval of the court.
(b) This property was sold on December 30, 1931.
(c) This property was sold but not at a foreclosure sale.

of transport. The goose that lays the golden eggs is being starved to death, and her food and the golden eggs she lays are being used to feed a gander with an insatiable appetite, but which yields no profit from his keep.

We shall have achieved Socialism in America without the necessity for a plebescite to adopt it whenever, over a considerable period, investment funds are readily entrusted to the government but are withheld from private enterprise. That condition obtained in the United States in 1932. It may continue unless the governments, local and national, revise their treatment of the railways as to regulation and taxation in comparison with the treatment accorded their rivals.

Although several railways were placed in the hands of receivers during the year, that fact gives no accurate measure of the railway financial crisis, because receiverships of far greater proportions were avoided by loans from the Railroad Credit Corporation and the Reconstruction Finance Corporation to meet interest payments and maturing loans, the failure to cover which would have thrown many more properties into the hands of the courts. The former corporation during the year advanced $47,114,000 to railways to meet interest obligations and the latter $261,666,197—for interest and other pressing requirements—although the Interstate Commerce Commission had authorized loans of almost $100,000,000 additional from the latter corporation which have not yet been advanced. The railways, also, during the year borrowed $357,428,000 on short term from bankers.

R. F. C. Collateral Requirements

Collateral requirements of the Reconstruction Finance Corporation are approximately as severe as those of commercial banks, i.e., collateral is required of a market value substantially in excess of the advances made. This being the case and the market being what it is, a number of roads which still need R. F. C. advances if they are to avoid receivership are about at the end of their tether. Failing a brisk upturn in business, their

Table V—Partial List of Loans Received from Reconstruction Finance Corporation or from Railroad Credit Corporation by Companies in Receivership

Name of Road	R. F. C. Loans	R. C. C. Loans
Ann Arbor	$634,757	.....
Central of Georgia	3,124,319	$1,692,681
Florida East Coast	627,075	.....
Fort Smith & Western	227,434	.....
Georgia & Florida	354,721	.....
Mobile & Ohio	.....	785,048
New Orleans Great Northern	.....	200,000
Norfolk Southern	.....	290,000
St. Louis-San Francisco	5,190,000	3,805,175
Wabash	14,060,747	.....

fate will depend upon liberalization of R. F. C. collateral requirements, as the railroads have recommended.

Stagnation in All But Distress Financing

Public financing by the railways was virtually nonexistent in 1932. Short term financing, to meet interest and maturing obligations and, to some slight extent, to finance improvements, as before stated, totaled $656,000,000, of which $357,428,000 was from banks. More than one billion dollars of bonds were issued during the year, however—most of them capitalizing additions and betterments, and being used as collateral to secure short term loans from the banks, the Reconstruction Finance Corporation and the Railroad Credit Corporation.

The only public offering of securities of any consequence undertaken during the year was a $12,500,000 issue of convertible, 10-year, 6 per cent collateral trust bonds by the Canadian Pacific and an issue of $1,800,000 of 5 per cent equipment trust certificates by the Reading.

The former was offered at par to yield 6 per cent and the latter was priced by the bankers to yield from 4 per cent to 4.6 per cent. The total of long term railroad financing, as reported by the Wall Street Journal

Table VI—Railroad Mileage in the Hands of Receivers

(Figures to 1931, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1931. Figures for 1932 Compiled by *Railway Age*)

Year ended	Miles of road operated by receivers at close of year	Net change during the year in miles of road operated	Number of roads in charge of receivers at close of year
June 30, 1894	40,819	....	192
1895	37,856	−2,963	169
1896	30,476	−7,380	151
1897	18,862	−11,614	128
1898	12,745	−6,117	94
1899	9,853	−2,892	71
1900	4,178	−5,675	52
1901	2,497	−1,681	45
1902	1,475	−1,022	27
1903	1,185	−290	27
1904	1,323	+138	28
1905	796	−527	26
1906	3,971	+3,175	34
1907	3,926	−45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	−5,273	39
1911	4,593	−664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,535	+7,130	94
Dec. 31, 1916	34,804	−2,550*	80
1917	17,376	−17,428	82
1918	19,208	+1,832	74
1919	16,590	−2,618	65
1920	16,290	−300	61
1921	13,512	−2,778	68
1922	15,259	+1,747	64
1923	12,623	−2,636	64
1924	8,105	−4,518	61
1925	18,687	+10,582	53
1926	17,632	−1,055	45
1927	16,752	−880	40
1928	5,256	−11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	24,448	+11,478	53

* Represents decrease for six months.

for the year, was $11,827,000, and of notes $13,125,000. Comparisons with other years are shown in Table II.

Dividends Disappear

Dividend payments on common stocks practically ceased—only five major railroads continuing them, and only one of the four maintaining the same rate as heretofore.

Some of the major dividend changes (both common and perferred) effected during the year were as follows:

The directors of the Alabama Great Southern omitted the $2 semi-annual dividend on common in May and reduced that on preferred from $2 to $1.50.

The Atchison, Topeka & Santa Fe in January reduced its common stock from an annual dividend basis of 10 per cent to 6 per cent. In April the rate was further reduced to 4 per cent and in July this dividend was passed.

In May the directors of the Atlantic Coast Line omitted its semi-annual dividend which, at the previous meeting, had been lowered from a $7 annual basis to $4. In October the dividend on the company's 5 per cent preferred stock was omitted.

The Baltimore & Ohio in March omitted the dividend on its preferred stock.

The directors of the Boston & Maine in March failed to act on the dividend due on its prior preference stock.

The Canadian Pacific, which in February paid a dividend of 31¼ cents on its common stock, in August omitted action on a dividend.

The Chicago, Burlington & Quincy reduced the semi-annual dividend from $5 to $3 in June. In December the dividend was omitted.

The Colorado & Southern during the year omitted dividends on its first and second preferred stock.

The Delaware & Hudson in August reduced the common dividend from a $9 annual basis to $6.

The Delaware, Lackawanna & Western declared no common dividends during the year.

The Great Northern, which has no common stock, in June omitted the semi-annual dividend due on its preferred stock.

The Illinois Central in February omitted the semi-annual dividend due on its preferred stock.

The Lehigh Valley in March omitted dividend action on its preferred stock.

The Louisville & Nashville omitted its semi-annual dividend in May.

Directors of the Nashville, Chattanooga & St. Louis in January failed to declare the usual semi-annual dividend due at that time.

The New York Central in May omitted the quarterly dividend on its common stock.

Table VII—Summary of Railroad Receiverships and Foreclosure Sales, 1876 to 1932

	Roads Placed in Receivership			Summary of Foreclosure Sales		
Year	Number of roads	Miles	Bonds and stocks	Number of roads	Miles	Bonds and stocks
1876...	42	6,662	$467,000,000	30	3,840	$217,848,000
1877...	38	3,637	220,294,000	54	3,875	198,984,000
1878...	27	2,320	92,385,000	48	3,906	311,631,000
1879...	12	1,102	39,367,000	65	4,909	243,288,000
1880...	13	885	140,265,000	31	3,775	263,882,000
1881...	5	110	3,742,000	29	2,617	137,923,000
1882...	12	912	39,074,000	16	867	65,426,000
1883...	11	1,990	108,470,000	18	1,354	47,100,000
1884...	37	11,038	714,755,000	15	710	23,504,000
1885...	44	8,836	385,460,000	22	3,156	278,394,000
1886...	13	1,799	70,346,000	45	7,687	374,109,000
1887...	9	1,046	90,318,000	31	5,478	328,181,000
1888...	22	3,270	186,814,000	19	1,596	64,555,000
1889...	22	3,803	99,664,000	25	2,930	137,815,000
1890...	26	2,963	105,007,000	29	3,825	182,495,000
1891...	26	2,159	84,479,000	21	3,223	169,069,000
1892...	36	10,508	357,692,000	28	1,922	95,898,000
1893...	74	29,340	1,781,046,000	25	1,613	79,924,000
1894...	38	7,025	395,791,000	42	5,643	318,999,000
1895...	31	4,089	369,075,000	52	12,831	761,791,000
1896...	34	5,441	275,597,000	58	13,730	1,150,377,000
1897...	18	1,537	92,909,000	42	6,675	517,680,000
1898...	18	2,069	138,701,000	47	6,054	252,910,000
1899...	10	1,019	52,285,000	32	4,294	267,534,000
1900...	16	1,165	78,234,000	24	3,477	190,374,000
1901...	4	73	1,627,000	17	1,139	85,808,000
1902...	5	278	5,835,000	20	693	39,788,000
1903...	9	229	18,823,000	13	555	15,885,000
1904...	8	744	36,069,000	13	524	28,266,000
1905...	10	3,593	$176,321,000	6	679	$20,307,000
1906...	6	204	55,042,000	8	262	10,400,000
1907...	7	317	13,585,000	6	114	13,777,000
1908...	24	8,009	596,359,000	3	138	2,547,000
1909...	5	859	78,095,000	12	2,629	250,033,000
1910...	7	735	51,427,500	17	1,100	93,660,109
1911...	5	2,606	210,606,882	13	1,386	40,741,543
1912...	13	3,784	182,112,497	12	661	25,910,990
1913...	17	9,020	477,780,820	6	1,159	86,163,850
1914...	22	4,222	199,571,446	9	1,470	83,189,500
1915...	12	20,143	1,070,808,628	11	3,914	285,258,782
1916...	9	4,439	208,159,689	26	8,355	703,444,855
1917...	19	2,486	61,169,962	20	10,963	557,846,348
1918...	8	3,519	242,090,800	11	763	24,735,187
1919...	7	244	11,886,779	8	459	15,479,587
1920...	10	541	21,620,150	7	380	7,676,200
1921...	14	1,744	63,872,113	11	4,173	306,123,942
1922...	12	4,330	329,114,860	15	6,151	299,491,646
1923...	10	2,218	87,913,581	8	637	14,622,900
1924...	11	920	30,223,372	14	3,992	269,251,082
1925...	6	11,368	680,422,080	6	638	9,965,000
1926...	6	88	2,821,400	12	12,852	626,662,708
1927...	6	924	45,236,674	5	142	4,254,000
1928...	1	19	529,000	4	209	6,393,250
1929...	3	634	30,981,391	5	562	20,715,065
1930...	4	4,752	277,323,994	2	1,048	124,668,500
1931...	19	5,195	432,151,526	2	102	993,860
1932...	13	11,817	626,577,314	8	394	8,575,178

The New York, New Haven & Hartford in June omitted the quarterly dividend due on its cumulative convertible 7 per cent preferred stock.

The Norfolk & Western in June reduced the common dividend rate from $10 to $8 per annum.

The Northern Pacific in March deferred dividend action on its common stock and, in June, formally omitted such action.

The Pennsylvania declared no dividends in the last three quarters of the year, a disbursement at the annual rate of 4 per cent having been made in the first quarter.

The Reading's common dividend rate was reduced to a 4 per cent annual basis at the end of 1931. In March the rate was further reduced to 2 per cent.

The Southern Pacific declared no dividends on its common stock in 1932.

The Union Pacific in May reduced its common dividend from a $10 annual basis to $6.

The Virginian in September omitted its quarterly dividend on common stock.

Receiverships Mount

A total of 13 railroads with a mileage of 11,817 were placed in the hands of receivers during the year. At the close of the year the total number of roads in receivership was 53 and their mileage was 24,448. This was the greatest mileage which has been in the hands of courts since 1916 when the total was 34,804 miles. As indicated before, this total would have been greatly increased but for the aid of the Reconstruction Finance Corporation and the Railroad Credit Corporation. The greatest railway mileage ever operated by receivers was 40,819 at the close of the fiscal year ended 1894. Yet in that year the railways as a whole had net income of $60,173,000. In 1932, by contrast, the net *deficit* is estimated at approximately 200 millions—which suggests what the showing might be today had nature, the law and finance been permitted to take their normal course unhindered.

Table VIII—Railroads in the Hands of Receivers on December 31, 1932

Road	Mileage operated	Mileage owned	Date of receivership	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Ann Arbor	294	294	Dec. 4, 1931	$9,164,341	$7,250,000	$17,333,198	
Apache Railway	72	72	Sept. 29, 1931	1,055,000	600,000	1,655,000	
Apalachicola Northern	99	99	May 28, 1932	2,000,000	1,000,000	3,000,000	
Beaufort County Lumber Company Railroad	25	25	Dec. 12, 1931	.....	.....	.....	
Boyne City, Gaylord & Alpena	92	92	Dec. 1, 1931	800,000	669,800	1,469,800	
California & Oregon Coast	15	15	Feb. 19, 1925	528,201	350,000	903,201	
Cape Girardeau Northern	13	104	Apr. 14, 1914	1,146,000	110,000	1,431,900	
Caro Northern	17	17	July 23, 1919	.....	.....	.....	
Central of Georgia	1,944	1,419	Dec. 19, 1932	53,722,000	20,000,000	77,922,000	
Chesterfield & Lancaster	36	32	Apr. 14, 1931	186,000 a	500,000	686,000	
Chicago, Attica & Southern	155	140	Aug. 4, 1931	441,200	2,304,711	2,745,911	
Chicago, Springfield & St. Louis	87	79	Jan. 24, 1930	500,000	204,960	704,960	This road was sold at foreclosure sale on June 25, 1931, but the receiver is still operating the property.
Cowlitz, Chehalis & Cascade	32	32	Mar. 7, 1932	800,883	425,000	1,225,883	
*East & West Coast	48	48	Feb. 2, 1931	624,333	250,000	889,333	
Florida East Coast	844	859	Sept. 1, 1931	57,000,000	37,500,000	99,660,075	
*Florida, Western & Northern	233	233	Feb. 2, 1931	14,999,000	5,000	15,164,000	
Fort Smith & Western	250	197	June 1, 1931	5,244,000	1,248,000	6,492,000	Capital stock represented by 62,400 shares of no par value.
Franklin & Pittsylvania	21	21	May 26, 1932	None	30,100	30,100	Abandonment of this road has been authorized by the Interstate Commerce Commission.
Gainesville & Northwestern	36 b	34	Dec. 8, 1923	None	750,000	775,000	
Gainesville Midland	74	72	Feb. 15, 1921	949,285	550,000	1,499,285	See *Railway Age*, Jan. 5, 1929, p. 67.
Georgia & Florida	464	421	Oct. 19, 1929	7,446,000	13,382,441	21,875,441	Capital stock includes 100,000 shares common of no par value.
*Georgia, Florida & Alabama	192	192	Nov. 7, 1931	1,750,000	2,010,678	4,160,678	Capital stock includes 10,000 shares common of no par value
Jacksonville & Havana	60 c	42	Feb. 1, 1930	300,000	160,810	460,810	
Minneapolis & St. Louis	1,628	1,515	July 26, 1923	43,366,051	25,792,600	72,238,320	
Minnesota Western	115	112	Jan. 25, 1932	672,000	1,440,238	2,112,238	
Missouri & North Arkansas	365	335	May 5, 1927	3,500,000	3,000,000	7,200,000	
Mobile & Ohio	1,153	913	June 3, 1932	32,169,500	6,016,800	43,841,300	
Nevada Copper Belt	41	41	Apr. 2, 1925	622,000	.....	624,500	
New Orleans Great Northern	265	228	Nov. 7, 1932	8,248,000	7,500,000	16,238,000	
Norfolk Southern	933	790	July 27, 1932	15,401,000	16,000,000	31,654,400	
North & South	41	41	Aug. 1, 1924	None	None	5,627,222	Court order judgments $4,911,771
Ohio & Kentucky	40	39 d	Dec. 2, 1925	447,775	300,000	757,775	
Oklahoma Union	19	19	July 1, 1929	750,000	1,340,950	2,090,950	
Pittsburg, Shawmut & Northern	198	160	Aug. 1, 1905	14,655,600	15,000,000	31,377,950	
Pittsburgh & Susquehanna	18	18	Apr. 22, 1931	300,000	300,000	600,000	
Raleigh & Charleston	43	43	May 1, 1931	550,000	574,500	1,124,500	
Rio Grande Southern	174	174	Dec. 16, 1929	4,509,000	4,510,000	9,065,000	
Rutland, Toluca & Northern	21	21	Mar. 16, 1931	225,000	97,000	322,000	
St. Louis San Francisco	5,890	5,802	Nov. 1, 1932	268,178,767	114,701,326	403,827,093	
Sandy River & Rangeley Lakes	97	97	July 8, 1923	837,000	340,000	1,177,000	
Santa Fe, San Juan & Northern	57	32	Oct. 14, 1931	.....	.....	.....	
Savannah & Atlanta	145	142	Mar. 4, 1921	3,365,000	2,250,000	6,115,000	
Savannah & Statesboro	33	33	May 1, 1931	185,000	200,000	385,000	
Seaboard Air Line	4,431	3,422	Dec. 23, 1930	140,898,908 e	85,110,662	254,227,270	
*Seaboard All-Florida	184	184	Feb. 2, 1931	17,881,667	2,500	17,984,167	
Sierra Railway Company of California	79	79	May 5, 1932	1,747,000	3,248,000	4,995,000	
Sievern & Knoxville	26		Dec., 1932	.....	.....	.....	
Tallulah Falls Railway	57	57	June 24, 1923	1,519,000	323,400	1,852,400	
Tonopah & Goldfield	102	93	July 20, 1932	None	1,051,500	1,051,500	
Wabash	2,474	2,024	Dec. 1, 1931	122,489,326	138,120,699	292,605,972	
Waco, Beaumont, Trinity & Sabine	115	115	Feb. 8, 1930	330,000	1,113,000	1,503,000	
Wichita Northwestern	100	100	Nov. 10, 1932	381,750	1,690,000	2,117,750	
Wisconsin Central	1,158	1,030	Dec. 2, 1932	44,833,000	27,392,200	72,225,200	

* Leased to Seaboard Air Line.

(a) Exclusive of $67,000 principal amount of Second Mortgage 6 per cent Bonds Matured January 15, 1918.

(b) Two miles operated under contract.

(c) This company has the right to operate over the line of the Chicago, Burlington & Quincy between Jacksonville and Waverly, a distance of 17.95 miles.

(d) Includes leased line also.

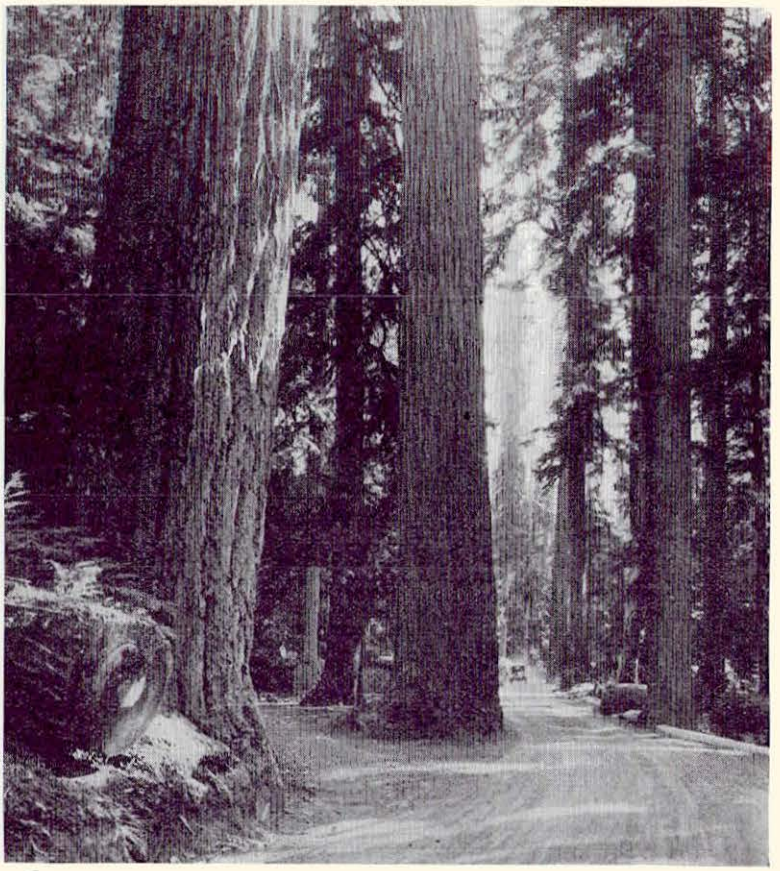
(e) Exclusive of pledged securities and exclusive of the following issues which became due on the dates indicated, no provision for the payment of such issues having been made up to the present time, viz:

Raleigh & Augusta Air Line First Mortgage Bonds Extended	Jan. 1, 1931	$1,000,000
Seaboard Air Line Railway Co. Three Year Secured Notes	Feb. 1, 1931	7,500,000
Seaboard & Roanoke First Mortgage Bonds Extended	July 1, 1931	2,500,000

Cost of Railway Materials Reduced in 1932

Value of purchasing dollar substantially raised by further declines in the prices of most commodities, including rail

By D. A. Steel
Purchases and Stores Editor, Railway Age



The West Coast Supplies Much of the Railroad Lumber

THE past year, while proving a disappointment to railroads which have been holding scrap iron for higher prices, further increased the value of the railway supply dollar in the material and equipment markets by depressing prices to the lowest levels reached in years. The reductions affected almost all commodities.

Reductions of 5 to 12 per cent in the delivered cost of coal were common last year. The prices were lower in each region, and the average cost of all coal purchased, amounting to $2.08 per ton, including freight, was 7 per cent below the cost in 1931, 11 per cent below 1930, and 12 per cent under the average for the period 1927 to 1929, inclusive.

Fuel oil cost some roads more than in 1931, but the average was less in each region, and the cost of all fuel oil bought, averaging 1.55 cents per gal., including freight, was 12 per cent below the cost in 1931, 22 per cent below 1930, and 33 per cent under the average cost per gallon in the three years from 1927 to 1929, inclusive.

Rail Prices Cut

Materials of iron and steel declined approximately 9 per cent in price from 1931 and were about 12 per cent lower than the prices paid in 1927 to 1929, the reductions including a change in the price of rail from $43 per net ton paid since 1922 to $40, a difference of 7.5 per cent. The prices of non-ferrous materials declined 20 to 30 per cent from the corresponding prices paid in 1931 and are now about 40 to 50 per cent below the prices paid in 1927 to 1929, inclusive. Forest products and miscellaneous items are now selling for about 10 per cent and 15 per cent, respectively, less than in 1931, and 27 and 23 per cent, respectively, under the prices paid in 1927 to 1929, inclusive, while scrap-iron prices have declined 10 to 25 per cent from the prices in 1931 and now range from 45 to 60 per cent under the prices paid in 1929.

Value of Supply Dollar Increased

As prices now stand, the roads can buy 20 per cent more fuel for the same money than in 1927 to 1929, inclusive, about 15 per cent more steel, 50 per cent more fuel oil, over twice as much copper, 35 per cent more lumber and ties, and about 20 per cent more material of all kinds. Many steel prices are now lower than at any time since 1921 and not a few correspond with 1916 values. One must go back to 1915 to find comparable fuel costs, to 1913 to find comparable prices for many of the prevailing lumber costs and to 1907 for prices equal to some of the prices paid in 1932. Prevailing scrap prices have no counterpart in 20 to 30 years. As a result of the reductions in 1931 and previous years, railroads can now go into the markets and buy many new materials for considerably less than the prices at which similar materials are now carried in their own material and supply accounts.

The causes of these declines in prices are pretty well understood. They are the net result of increased competition and reduced purchasing in all directions. The reductions made in railway purchases since 1929 have already been discussed in these columns.* Except in certain particulars, prices were pointing downward before the material markets became engulfed in the worst financial and business disorder that has been experienced for years, and were further depressed last year by reductions in wages and the uncertainties injected into all attempts at restoring business by a bitterly-fought na-

*Railway Age, January 7, 1932.

tional election involving international, as well as national, questions, all affecting industry. All things considered, prices of many commodities withstood the rigors of the past three years remarkably well, reflecting, in part, the lack of demand for the commodities and also the reluctance of railroads to take an unfair advantage of their position to depress prices unduly.

Purchases and Prices in 1933

As pointed out elsewhere in this and other issues of *Railway Age,* facts regarding railway purchases and maintenance in the past three years and the drift of revenues, carloadings and general conditions affecting the railway business, forecast increased purchases this year, and this conclusion is further supported by opinion on representative railroads. Out of 10 roads selected at random, the opinion stands 7 for increased purchases of fuel, 7 for increased purchases of rail, 6 for increased purchases of ties and 5 for increased purchases of miscellaneous materials, the anticipated purchases ranging from a slight increase to 25 per cent.

The influence of heavier buying on prices is problematical, owing to the result of other factors than the volume of purchases, among them being the reduced wages, low rates of production, credit difficulties and, in some places, the tariff, as well as the pressure of competition. There was less reduction in the price of iron and steel items in 1932 and previous years than in other railway materials, although the reductions made in purchases of iron and steel were among the largest. This, together with the fact that slightly higher prices were paid by some roads last fall for some items, such as machine bolts, cast-iron pipe, steel pipe, nails, track bolts and sheet steel, show that iron and steel prices are

Average Prices of Railroad Materials Paid by Representative Roads—1927-1932

Description	Unit	1927	1928	1929	1930	1931	1932 First quarter	1932 Mid-year	1932 Last quarter	1932 High	1932 Low	1932 Average	% of av. 1927-1929, incl.
Track Materials													
Rail	N. t.	$43.00	$43.00	$43.00	$43.00	$43.00	$43.00	$43.00	$40.00	$43.00	$40.00	$42.00	97.5
Track bolts, Heat-treated, with nuts	Cwt.	4.00	3.836	3.756	3.946	3.740	3.432	3.41	3.421	3.75	3.25	3.421	88.5
Track chisels, Alloy steel	Ea.	1.96	1.76	1.74	1.71	1.648	1.647	1.647	1.647	1.73	1.02	1.647	90.5
Track spikes, High-carbon steel	Cwt.	2.80	2.76	2.71	2.68	2.57	2.41	2.43	2.328	2.82	1.95	2.417	89.0
Track shovels, No. 2 carbon steel	Doz.	12.953	13.823	11.286	10.02	9.98	10.74	10.92	11.14	13.75	8.65	10.93	86.5
Bond wire, 48-in. copper-clad	Cwt.	14.78	17.50	18.566	17.69	15.89	15.445	14.96	14.738	16.94	14.00	15.05	89.0
Wire fence, 26-in. to 47-in. woven	Rod	.467	.488	.426	.428	.396	.383	.383	.383	.51	.23	.383	83.5
Steel, structural, Angles	Cwt. b.	1.986	1.986	2.35	1.98	1.84	1.747	1.75	1.73	2.15	1.50	1.743	81.5
Steel, structural, Fabricated	Cwt. b.	4.176	4.176	3.326	3.35	2.73	2.727	2.727	2.727	4.95	1.70	2.727	70.0
Pipe, cast-iron, 12-in. Class B	N. t.	41.136	41.136	39.416	40.37	35.583	31.54	34.94	35.34	44.00	26.00	33.94	83.5
Pipe, clay, 24-in. vitrified	Ft.	1.39	1.386	1.169	1.76	1.406	1.86*	2.027*	1.97*	2.76*	1.06*	1.95*	...
Locomotive and Car Materials													
Bolts, ¾ by 6 machine, with nuts	100 pcs.	5.13	5.02	4.872	4.816	4.20	3.656	4.207	4.282	6.05	3.12	4.048	81.0
Boiler tubes, 2-in. No. 11 gage steel	Ft.	.172	.172	.174	.154	.152	.152	.152	.152	.163	.14	.152	88.0
Bar steel, Open-hearth	Cwt. b.	2.13	2.583	2.173	1.85	1.808	1.73	1.72	1.71	2.25	1.46	1.72	75.0
Steel, High-speed tool	Lb. b.	.59	.58	.57	.66	.52	.493	.493	.496	.60	.30	.494	85.0
Steel, Boiler	Cwt. b.	2.01	2.006	2.33	2.01	1.86	1.733	1.748	1.738	2.23	1.45	1.739	82.5
Steel, Spring	Cwt. b.	2.74	2.636	2.84	2.62	2.426	2.379	2.376	2.374	3.50	1.53	2.376	86.5
Steel, 24-gage black	Cwt.	3.206†	2.998†	3.253†	2.90	2.65	2.56	2.60	2.91	3.69	1.98	2.69	86.0
Pig iron, No. 1	G. t.	20.50	20.50	17.353	16.61	15.378	15.00	14.71	14.86	16.00	14.19	14.857	76.5
Brake shoes, Locomotive driving	N. t.	61.70	61.70	59.546	60.00	56.538	54.928	54.035	53.892	59.00	52.00	54.285	89.0
Brake shoes, Freight car	N. t.	36.93	39.98	37.55	35.42	35.128	34.428	33.535	33.357	38.00	31.00	32.70	85.5
Castings, grey iron, Green sand	Cwt.	3.863	3.97	4.12	4.12	4.096	3.871	3.802	3.788	4.50	3.00	3.82	96.5
Castings, malleable, 7 to 15 lb., 25 to 100 pcs	Cwt.	9.136	8.506	8.686	8.27	7.681	7.662	7.569	7.549	9.75	5.00	7.59	87.0
Castings, steel, 25 to 50 lb., under 50 pcs	Cwt.	8.64	7.97	8.32	8.46	7.73	7.629	7.49	6.99	9.00	5.00	7.37	88.5
Couplers, 5 by 7 by 6½ ARA-D car	Pr.	41.20	40.20	40.20	41.20	39.20	38.395	37.995	37.995	37.70	36.33	37.20	90.0
Axles, locomotive, Driving, carbon	Cwt.	5.166	5.21	4.84	4.29	4.756	4.53	4.556	4.568	5.25	3.96	4.552	89.5
Axles, car, 5 by 9 jour. and seat, rgh. turned	Cwt.	2.94	2.94	2.946	2.88	2.881	2.765	2.76	2.746	3.02	2.24	2.755	93.5
Tires, frt. loco., 33 in. and over, rough bored	Cwt.	6.11	6.11	5.846	6.22	6.033	5.899	5.908	5.786	7.31	5.25	5.865	97.5
Pipe, 1-in. standard black steel	Ft.	.076	.069	.066	.067	.069	.064	.063	.063	.094	.054	.063	90.0
Wire nails, Common	Cwt. b.	2.58	2.62	2.625	2.29	2.079	2.17	2.186	2.187	2.60	1.81	2.182	84.0
Pig lead, Virgin	Cwt.	7.046	6.436	6.95	5.64	4.427	3.70	3.41	3.48	4.00	2.75	3.53	51.7
Copper tubing, ⅜-in.	Lb.	.28	.28	.302	.273	.293	.173	.193	.158	.193	.158	.174	60.0
Copper, Sheet, soft	Lb.	.218	.23	.27	.259	.181	.188	.178	.175	.287	.104	.180	75.0
Journal bearings, A. R. A.	Lb.	.142	.141	.167	.149	.10	.081	.065	.064	.115	.059	.070	46.5
Wire, copper, No. 9 bare	Lb.	.149	.167	.195	.163	.115	.103	.101	.095	.155	.073	.100	59.0
Wire, copper, T. B. weather-proof No. 10	Cwt.	18.706	19.73	21.00	19.00	15.814	13.416	12.685	12.90	14.33	11.35	13.00	65.5
Fuel and Miscellaneous													
Boiler lagging, 1¼ in. by 6 by 36 magnesia	Sq. ft.	.21	.22	.236	.160	.155	.156	.156	.156	.180	.120	.156	46.7
Fire brick, Soft	M	41.74	43.086	41.736	41.85	39.29	35.238	36.00	32.884	40.00	22.00	34.707	82.0
Hose, Air-brake, 1⅜ by 22 ARA	Ft.	.48	.46	.443	.45	.378	.34	.339	.339	.35	.26	.339	73.5
Leather, Belting, 6-in. double	Ft.	1.226	1.356	1.396	1.39	1.23	1.31	1.267	1.255	2.05	.98	1.277	95.5
Rope, ¾-in. manila	Lb.	.217	.199	.199	.180	.153	.15	.14	.135	.205	.09	.142	69.0
Rope, ¾-in. 6 by 19 plow steel	Ft.	.125	.119	.144	.14	.143	.134	.129	.120	.19	.10	.127	93.5
Rubber, red, ⅛-in. sheet packing	Lb.	.32	.28	.247	.25	.225	.176	.183	.169	.35	.105	.176	63.0
Fuel oil, Tank lots	Gal.	.028	.024	.021	.02	.017	.015	.014	.016	.047	.007	.015	65.0
Gasoline		....	....	....	....	....	.040	.054	.055	.08	.024	.049	...
Oil, Long-time burning—tanks	Gal.	.096	.09	.087	.117	.062	.06	.062	.062	.104	.028	.061	67.0
Oil, Car—tank lots	Gal.	.180	.157	.157	.163	.138	.127	.127	.127	.172	.074	.127	77.5
Grease, Driving box	Lb.	.160	.122	.125	.131	.122	.120	.117	.116	.144	.100	.118	72.0
Waste, Colored cotton	Lb.	.098	.091	.086	.084	.076	.055	.050	.048	.092	.032	.051	55.5
Creosote oil, Tank lots	Gal.	.157	.157	.139	.130	.115	.114	.106	.104	.118	.09	.108	72.0
Glass, 24 by 24 dsa.	Box	5.23	5.10	5.766	5.84	4.80	4.566	4.768	4.814	6.39	3.04	4.716	88.0
Linseed oil, Boiled	Lb.	.088	.093	.117	.120	.09	.073	.063	.07	.094	.053	.068	68.6
White lead, In oil—100-lb. keg	Lb.	.11	.102	.104	.106	.107	.091	.087	.085	.108	.074	.088	83.5
Cement, Portland, In paper	Bbl.	2.21	1.85	1.874	1.76	1.426	1.38	1.41	1.496	2.05	.74	1.429	72.2
Soda ash, Water softening	Cwt.	1.33	1.40	1.46	1.56	1.55	1.309	1.296	1.296	2.75	.80	1.30	93.8
Hydrated lime, Water softening	N. t.	13.63	11.99	11.96	9.73	9.53	9.61	9.44	9.423	17.50	6.50	9.49	75.6
Oxygen	100 cu. ft.	1.29	1.04	1.036	1.05	1.068	1.042	1.012	1.012	1.34	.60	1.02	91.0
Forest Products—Mill													
Lumber, Fir, 1 by 6 No. 1 common rough	M ft.	27.81	27.81	20.02	15.56	10.83	1by6by9 B&B siding			25.00	15.00	18.76	...
Lumber, Pine, 2 by 4 by 10, No. 1 com. rgh.	M ft.	32.93	29.99	26.21	25.83	18.93	2by6by18 B&B siding			30.00	17.00	21.83	...
Lumber, Fir sills, 6 by 10 by 40	M ft.	33.02	31.69	21.50	21.76	14.50	6by6 sel. com. rgh.			13.00	8.00	10.32	...
Bridge stringers, Fir, 8 by 16 by 28 structural	M ft.	35.38	29.15	20.53	18.70	14.90	16 in.by 32 ft.,or less			15.00	11.00	12.52	...
Cross ties, Fir, 7 by 9 by 8′ 6	Ea.	.60	.60	.67	.80	.50	.40	.40	.40	.95	.35	.40	63.0
Cross ties, Pine, 7 by 9 by 8′ 6	Ea.	.67	.67	.67	.77	.65	.745	.733	.73	.97	.53	.53	82.0
Cross ties, White oak, 7 by 9 by 8′ 6	Ea.	.98	.95	.93	.92	.83	.62	.62	.614	.92	.25	.75	78.0
Scrap Iron													
Railroad scrap, No. 1 railroad wrought	N. t.	11.16	11.39	11.96	8.68	7.20	5.24	3.29	4.07	6.25	2.68	4.20	36.6
Railroad scrap, No. 1 heavy melt	N. t.	11.63	11.34	12.82	10.62	7.33	5.83	4.88	5.30	9.07	2.68	5.34	44.7
Railroad scrap, Rails for re-rolling	N. t.	13.80	12.92	14.49	12.55	10.05	7.85	6.13	6.64	11.25	2.68	7.18	53.0

* Culvert, 24-in. corrugated.
† 28-gage.

still being fairly well sustained. However, with ore operations at a standstill and the mills working below 20 per cent of their capacity, operators are more anxious to encourage business than to increase prices, and this is evidenced by the reduction made in prices of rail as late as last October. Opinion on the railroads is divided, half for a slight increase in steel prices and half for no change. Iron and steel prices are involved in the present controversy for reduced freight rates.

Fuel Prices

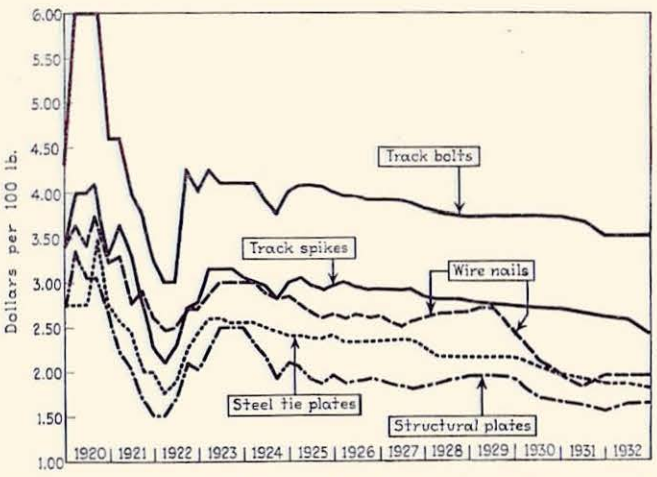
Despite all efforts of coal operators to stabilize their business and the effort of organized labor to maintain standards, the prices of coal have continued to fall with the reductions in consumption caused by more economical utilization, the use of substitutes and the general decline in industrial activities. Prices were 5 to 10 per cent less in the Southwest last year and are likely to be depressed further this year.

In New England, where the principal cost to the railroads is foreign-line freight, locomotive coal was purchased last year at mine prices as low as 95 cents per ton. In the Eastern and Central fields, reductions in wages and working time caused several labor disturbances and the shifting of tonnage from one mine to another, but these failed to affect prices or give the railroads any anxiety about the coal supply or coal prices this year, notwithstanding that the tonnage of fuel in storage is unusually low.

In the Central West, one road has contracted for coal at $1.95 per ton and $1.60 per ton in Illinois, as compared with $2.15 per ton and $2.00 per ton in 1932, and is buying Kentucky coal for $1.15, as compared with $1.20 per ton last year. In the Southwest where coal constantly faces competition from fuel oil, there were substantial reductions in prices, and, with the wage reductions made and the fact that no existing wage agreements in organized territory terminate this year, the prospect for increases in coal prices is remote. The opening of strip mines in the Southwest may depress prices still further.

Fuel Oil Higher

It is indicative of fuel-oil conditions that, while the average prices paid by the railroads in 1932 were less than in 1931, no railroad appears to have bought it for the lowest prices paid in 1931, and some roads paid twice as much in 1932 as in the previous year. In general, the prices of fuel oil bought on contract in 1932 were uniformly lower than in 1931, while spot prices during the last six months of 1932 were higher than in the corresponding months of 1931, as a consequence of reductions effected in crude-oil production in some districts. The tendency of small surpluses of fuel oil at refineries and the shrinkage in the proportion of fuel oil being produced from crude oil is to support prices, but they were reduced slightly this month.

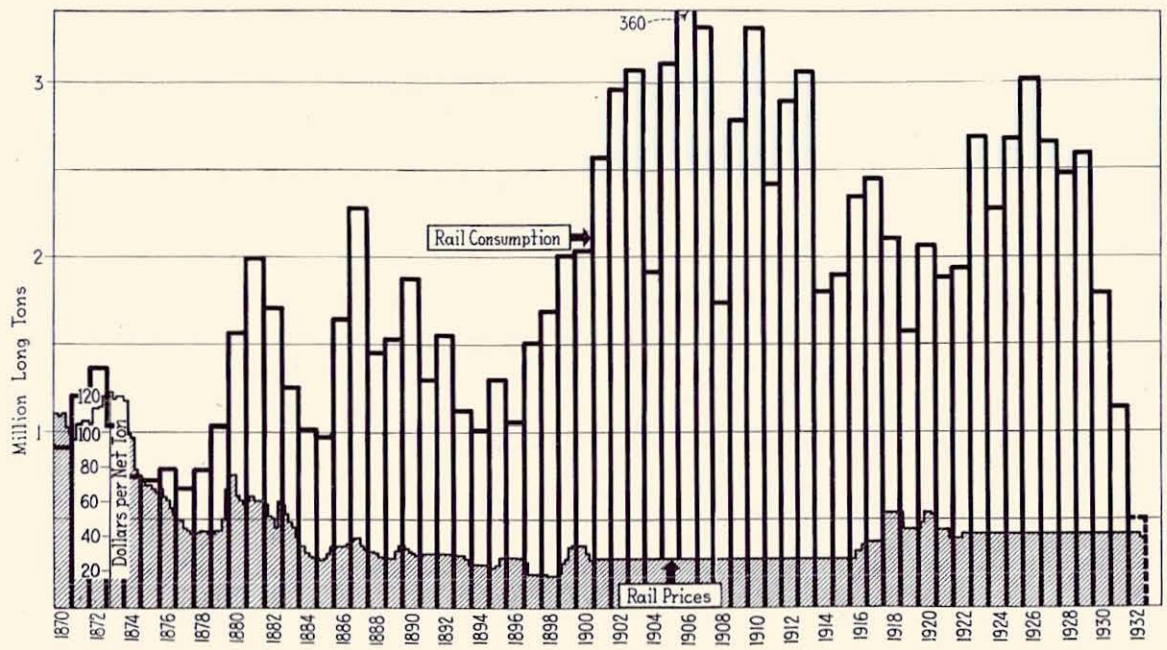


Price Trends of Typical Items of Steel Used for Maintenance of Way and Structures

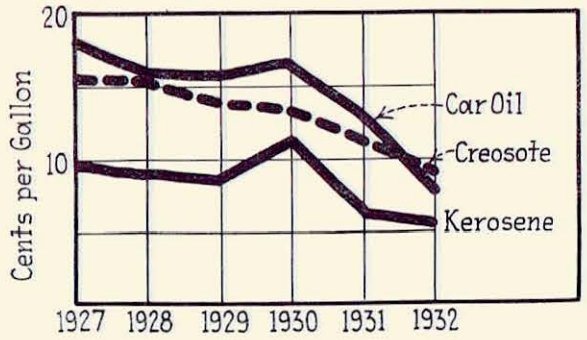
Increased Lumber Buying

Lumbering has been unusually depressed everywhere, with prices appearing to have been sustained better in the Southern district where the mills are fewer and better organized to control operations. These mills have practically eliminated surplus stocks and have orders requiring an increased rate of operation. With Southern Pine prices about double the prices for Western lumber and competition from other districts and from substitutes always present, increased prices are not anticipated.

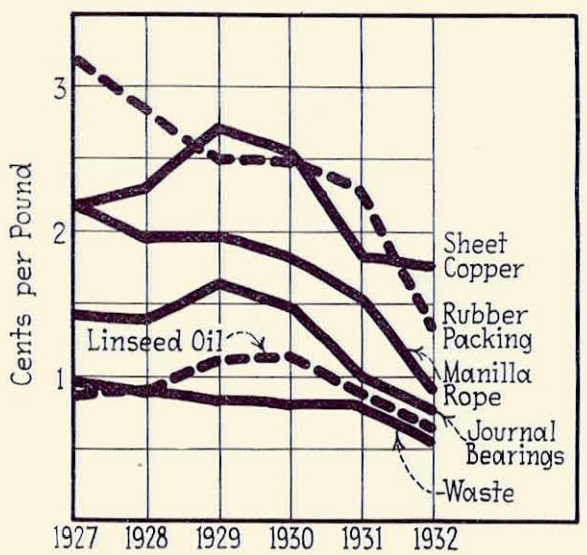
The mills of British Columbia not only serve the Canadian roads but have been exporting lumber to all



Rail Prices and Rail Consumption in the United States from 1870 to Date



Average Prices Paid for Various Oils Purchased by Railroads



Average Prices Paid by Railroads for Miscellaneous Materials

parts of the world, including California and Eastern United States. Last year, production for the United States was practically cut off by a tariff of $3 per M. This, together with the curtailment of purchases in Canada and all other countries, except Australia, depressed production in that territory to 19 per cent of the rate in 1929 and, as a result, railroad lumber can now be purchased for as low as $7 to $8 per M with little risk of any immediate increase.

Conditions in Washington and Oregon are reflected by the following comparisons in the prices paid for railway lumber in November, 1931, and November, 1932:

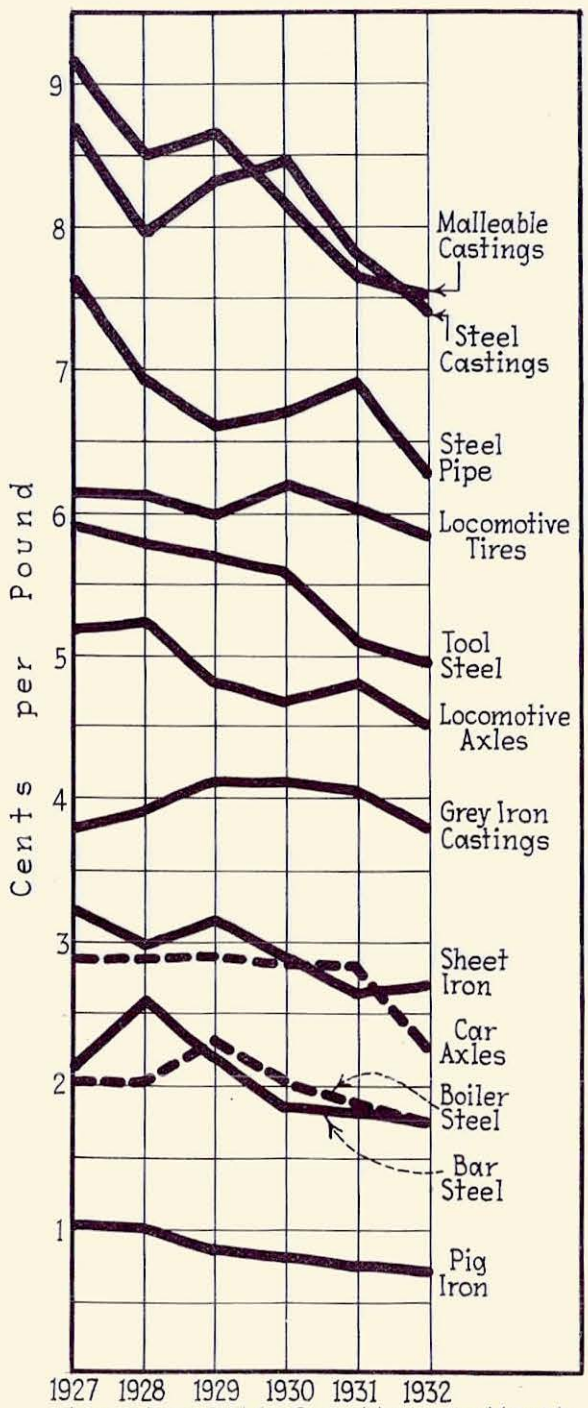
	November, 1931	November, 1932
Cross ties	$10.00	$8.50
Switch ties	10.50	9.00
Bridge timbers	12.00	10.00
Stringers	14.00	13.00
Plank	10.00	8.00
Car decking	13.00	11.00
Car sills	13.00	11.00
Car framing	13.00	10.00

West Coast mills are now operating at 23 per cent capacity and unfilled orders at present afford less than a month's work at that rate, all of which have an important bearing on the direction of prices this year.

Opinion on the trend of prices is divided about as follows: Six roads out of 10 anticipate higher prices and 3 roads no change, while 3 out of 5 roads anticipate increases in tie prices, contingent upon increases in tie purchases. Railroad tie stocks, in the aggregate, are large on the basis of the number of ties laid in 1932, but it is significant of the prospect for increased tie purchases that some roads have not purchased ties for two years, having relied upon the use of treated ties to reduce tie renewals to 50 per cent of normal requirements. Many roads will find it necessary to increase tie purchases this year, at least to provide stocks for application in 1934, and it is these conditions that have led several roads to anticipate the necessity of paying more for ties this year than was paid last year.

Miscellaneous Materials

While the average cost of miscellaneous materials purchased by the railroads is now lower than it has been for several years, the prices of specific commodities show considerable variation, both in value and in reduction. One of 14 roads paid more for boiler lagging last year than in 1931 and a second road spent less, while the others purchased it at the 1931 prices, which ranged from 12 cents to 18 cents per sq. ft., depending upon the thickness. Reductions in fire brick prices were

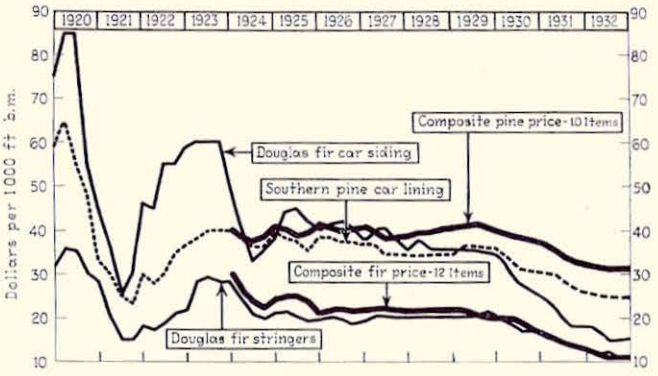


Average Prices Paid for Car and Locomotive Materials
(Tool Steel, High Speed-Cents per 10 lb.)

general. Air-brake hose, the delivered price of which is the same to all roads, was sold all last year at the prices fixed in the last quarter of 1931. The prices paid for leather belting, ranging from $1.01 to $1.92 per ft., last fall were lower than most of the roads paid in 1931, and in a few cases reflected slight reductions from last spring. Most of the roads are now paying less for rope than last spring, and the same is true of rubber.

Current prices paid for gasoline, ranging from 3.5 cents to 7.8 cents per gal. on different roads, are higher than the prices paid last spring, while kerosene prices, now ranging from 3.8 cents to 10.4 cents per gal., were stationary all year, although most of the prices were higher than those paid by the same roads in 1931. Prices paid for car oil, now ranging from 7.4 cents to 17.2 cents per gal., represent reductions in cost to some roads and increases to others, while the current prices for waste, ranging from 3.8 cents to 6.25 cents per lb., are substantially below both the prices of the first quarter of 1932.

The railroads are now paying from 9 cents to 10.8 cents per gal. for creosote oil, a substantial reduction



Trends of Typical Lumber Prices, Including Composite Values, Based on Mill Prices

some roads paid in January, 1932, and more than several roads paid in 1931, although the price of $0.74 per bbl. paid last year by one road was below the price paid by any road in 1931. The prices paid for oxygen, ranging from $0.60 to $1.25 per 100 cu. ft., were con-

Cost Per Ton of Coal for Locomotives—Class I Railroads*

	1924 Dollars	1925 Dollars	1926 Dollars	1927 Dollars	1928 Dollars	1929 Dollars	1930 Dollars	1931 Dollars	1932† Dollars
New England Region	5.14	4.66	4.59	4.52	4.34	4.24	4.18	3.94	3.76
Great Lakes Region	3.31	2.98	2.88	2.96	2.84	2.73	2.64	2.37	2.28
Central Eastern Region	2.62	2.28	2.26	2.26	2.09	2.01	1.96	1.84	1.65
Eastern District	3.11	2.75	2.67	2.70	2.55	2.45	2.39	2.22	2.06
Pocahontas Region	2.13	1.78	1.82	1.78	1.69	1.67	1.68	1.66	1.59
Southern Region	2.78	2.40	2.31	2.26	2.19	2.10	2.06	1.95	1.80
Southern District	2.62	2.25	2.19	2.15	2.08	2.00	1.96	1.88	1.75
Northwestern Region	3.42	3.19	3.09	3.21	3.02	2.79	2.66	2.55	2.54
Central Western Region	3.06	2.90	2.83	2.83	2.68	2.51	2.49	2.45	2.27
Southwestern Region	3.16	2.95	2.85	2.88	2.64	2.42	2.29	2.15	1.91
Western District	3.22	3.02	2.94	3.00	2.82	2.61	2.53	2.45	2.34
United States	3.03	2.72	2.63	2.66	2.53	2.40	2.34	2.21	2.08

* Invoice price plus freight charges by foreign lines changed to operating expenses—I. C. C. reports.
† 10 months.

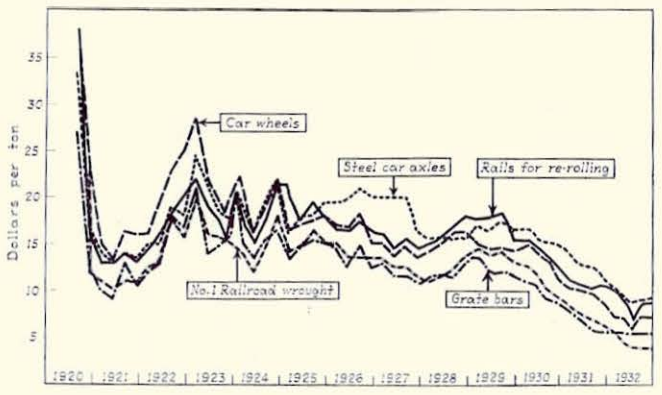
Cost Per Gallon of Fuel Oil for Locomotives—Class I Railroads*

	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932† Cents
Great Lakes Region	5.83	5.98	5.81	5.86	3.81	3.51	4.19	3.90	2.88
Central Eastern Region	...	...	...	...	4.17	4.07	3.67	3.54	3.20
Eastern District	5.83	5.98	5.81	5.86	3.84	3.55	4.13	3.87	2.90
Southern Region	3.57	3.96	3.97	3.97	2.98	2.37	2.21	1.85	1.28
Southern District	3.57	3.96	3.97	3.97	2.98	2.37	2.21	1.85	1.28
Northwestern Region	2.86	3.32	3.01	3.00	2.94	2.71	2.49	2.12	1.90
Central Western Region	2.98	3.23	2.72	2.54	2.37	2.10	1.97	1.82	1.68
Southwestern Region	2.44	2.85	3.14	3.03	2.46	1.98	1.89	1.59	1.27
Western District	2.75	3.09	2.91	2.78	2.47	2.12	1.99	1.76	1.55
United States	2.78	3.13	2.95	2.81	2.48	2.12	2.00	1.77	1.55

* Invoice plus freight charges—I. C. C.
† 10 months.

from the prices paid last spring by some roads and slight increases on other roads. The prevailing prices reflect smaller reductions in the cost of linseed oil and white lead.

The prices paid for cement last December, ranging from $0.74 to $1.75 per bbl., delivered, were higher than



Price Trends of Railroad Scrap Items

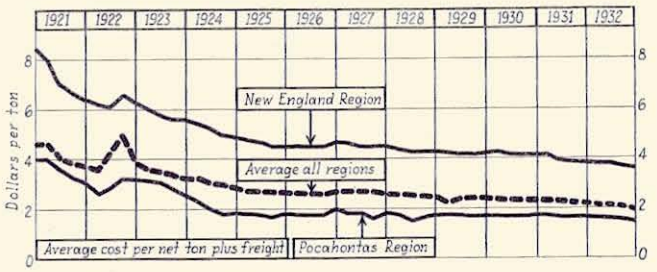
stant all year and were only slightly, if any, lower than the prices paid in 1931.

Scrap Prices Collapse

The scrap-iron conditions are reflected by the lowest prices per ton at which No. 1 heavy melting steel was sold by representative roads in the past several years, as follows:

Road	1929	1930	1931	1932
A	$11.50	$8.60	$5.55	$3.00
B	10.28	9.00	4.25	3.00
C	9.24	8.83	6.80	4.47
D	9.82	6.92	4.75	2.70
E	12.25	13.17	9.91	9.29
F	11.15	10.00	7.75	5.55

In the aggregate railroad scrap was sold in 1932 at prices from one-half to one-quarter of those obtained in 1929. Many roads which decided in 1930 and 1931 to withhold scrap from sale have thus been put to the necessity of selling their tonnage for considerably less than they had hoped to obtain for it or to continue holding it in anticipation of a recovery in scrap prices. Some roads obtained better prices last fall for scrap iron than earlier in the year, but a substantial recovery in scrap

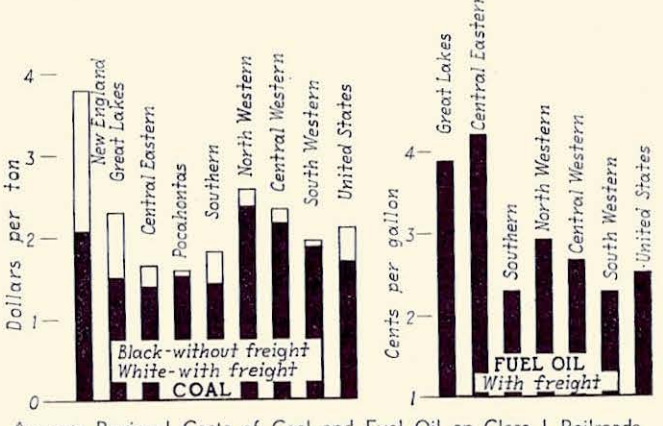


Variation in the Average Cost of Locomotive Coal per Month and the Corresponding Cost in the Regions with the Highest and Lowest Averages

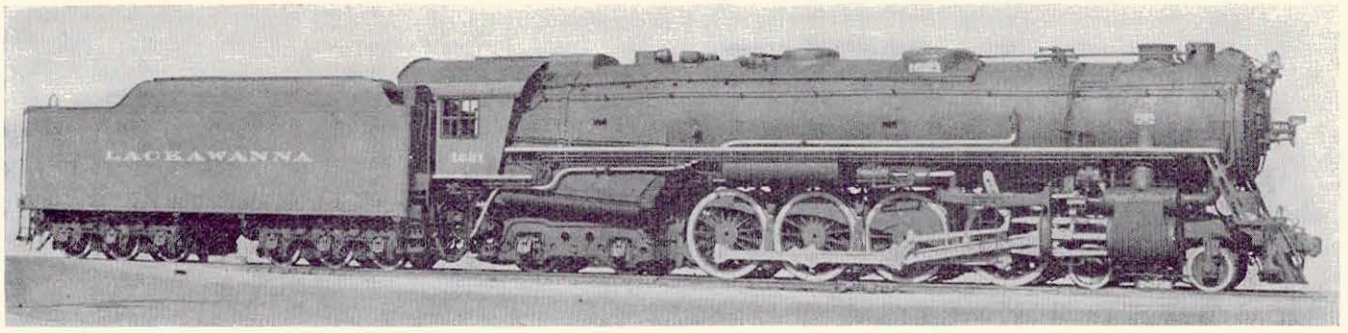
prices is not anticipated in the immediate future because of the unusually large available supply of scrap iron and the low rate of consumption in this and other countries. It is estimated that the railroads alone have over 2,000,000 tons of unsold scrap on hand. Railroads are endeavoring to prevail upon steel mills to accept more scrap tonnage in exchange for purchases, and it is reported that one or two railroads have succeeded in placing rail tonnage on that basis. The extent to which this practice will grow remains to be seen. In the meantime, the producers of scrap iron are being put to the necessity of radically readjusting their scrap handling prices to harmonize with present scrap values.

Average Cost Locomotive Coal Per Ton—Ten Months, 1932

Region and Road	With Freight 1932	With Freight 1931	Without Freight 1932	Without Freight 1931
New England Region:				
Bangor & Aroostook	$4.14	$4.37	$4.14	$4.37
Boston & Albany	4.04	4.17	1.66	1.78
Boston & Maine	3.85	4.13	3.19	3.57
Canadian National (in New Eng.)	4.30	4.74	.88	1.92
Canadian Pacific (lines in Maine)	4.87	5.21	2.42	3.34
Canadian Pacific (lines in Vermont)	4.68	4.89	1.82	1.88
Central Vermont	4.34	4.42	1.42	1.50
Maine Central	4.34	4.51	4.34	4.51
New York, New Haven & Hartford	3.25	3.38	.94	1.10
Rutland	3.48	3.73	2.20	2.34
Great Lakes Region:				
Ann Arbor	2.79	2.89	.96	1.10
Cambria & Indiana	1.54	1.80	1.54	1.80
Delaware & Hudson	2.98	3.00	1.61	1.74
Delaware, Lackawanna & Western	3.02	3.04	1.48	1.58
Detroit & Mackinac	3.49	3.39	1.03	1.09
Detroit & Toledo Shore Line	2.98	3.28	1.48	2.01
Erie and Chicago & Erie	2.09	2.26	1.51	1.69
Grand Trunk Western	2.75	2.82	1.02	1.17
Lehigh & Hudson River	3.51	3.60	.91	1.13
Lehigh & New England	2.74	2.83	1.17	1.27
Lehigh Valley	2.97	3.07	1.09	1.21
Michigan Central lines	1.94	2.13	1.79	1.96
Monongahela	1.18	1.45	1.18	1.45
Montour	1.63	1.93	1.63	1.93
New Jersey & New York	4.58	4.61	1.66	1.78
New York Central	1.80	1.99	1.55	1.67
New York, Chicago & St. Louis	2.49	2.65	1.41	1.72
New York, Ontario & Western	2.65	2.76	.88	.98
New York, Susquehanna & Western	4.17	4.29	1.60	1.76
Pere Marquette	3.30	3.32	1.45	1.50
Pittsburgh & Lake Erie	1.57	1.73	1.56	1.67
Pittsburg & Shawmut	1.71	1.79	1.71	1.79
Pittsburgh & West Virginia	1.09	1.24	1.09	1.24
Pittsburg, Shawmut & Northern	1.71	1.80	1.71	1.80
Wabash	2.24	2.18	1.53	1.74
Central Eastern Region:				
Akron, Canton & Youngstown	2.10	2.38	1.07	1.36
Atlantic City	3.29	3.42	1.34	1.51
Baltimore & Ohio	1.16	1.43	1.12	1.39
Bessemer & Lake Erie	1.85	1.94	1.74	1.84
Central of New Jersey	3.11	3.27	1.18	1.37
Chicago & Eastern Illinois	1.90	1.99	1.87	1.96
Chicago & Illinois Midland	1.94	1.99	1.85	1.99
Chicago, Indianapolis & Louisville	1.78	1.83	1.76	1.83
Cleve., Cin., Chic. & St. Louis	1.78	2.12	1.58	1.93
Detroit, Toledo & Ironton	2.43	2.63	1.31	1.55
Elgin, Joliet & Eastern	2.13	2.08	1.94	2.08
Illinois Terminal	2.02	2.29	1.92	2.19
Long Island	3.75	3.81	1.45	1.51
Missouri-Illinois	1.56	1.67	1.35	1.67
Pennsylvania lines	1.50	1.71	1.47	1.69
Reading	2.75	2.73	1.37	1.47
Staten Island Rapid Transit	4.04	4.11	1.63	1.75
Western Maryland	1.60	1.77	1.59	1.75
Wheeling & Lake Erie	1.35	1.47	1.35	1.47
Pocahontas Region:				
Chesapeake & Ohio	1.61	1.61	1.61	1.61
Norfolk & Western	1.40	1.55	1.40	1.55
Richmond, Fredericksburg & Potomac	3.15	3.30	.92	1.12
Virginian	1.60	1.75	1.60	1.75
Southern Region:				
Alabama Great Southern	1.97	2.29	1.72	1.84
Atlanta & West Point lines	2.67	2.89	1.43	1.62
Atlanta, Birmingham & Coast	1.97	2.08	1.56	1.68
Atlantic Coast Line	2.74	2.82	1.16	1.29
Central of Georgia	2.10	2.20	1.99	2.09
Charleston & Western Carolina	2.60	2.69	1.20	1.32
Cin., New Orleans & Texas Pac.	1.82	1.90	1.52	1.61
Clinchfield	1.19	1.35	1.19	1.35
Columbus & Greenville	2.50	2.62	1.41	1.48
Georgia	3.02	3.08	1.16	1.23
Georgia & Florida	2.87	3.01	1.13	1.27
Georgia, Southern & Florida	3.93	3.99	1.91	2.03
Gulf & Ship Island	3.20	3.08	1.24	1.20
Gulf, Mobile & Northern	1.81	1.89	1.01	1.11
Illinois Central lines	1.72	1.89	1.52	1.67
Louisville & Nashville	1.36	1.64	1.36	1.64
Mississippi Central	2.46	2.58	.92	1.06
Mobile & Ohio	1.83	1.96	1.83	1.96
Nashville, Chattanooga & St. Louis	1.84	1.94	1.76	1.86
New Orleans & Northeastern	3.40	3.58	1.68	1.90
New Orleans Great Northern	2.49	2.57	1.03	1.13
Norfolk Southern	2.77	3.07	.88	1.11
Northern Alabama	1.57	1.73	1.57	1.73
Seaboard Air Line	2.37	2.48	1.21	1.32
Southern	1.41	1.52	1.35	1.45
Tennessee Central	1.50	1.79	1.50	1.79
Northwestern Region:				
Chicago & North Western	2.16	1.83	2.03	1.83
Chicago Great Western	2.63	2.67	1.42	1.43
Chicago, Mil., St. P. & Pacific	2.14	2.25	2.11	2.25
Chicago, St. P., Minn. & Omaha	3.61	3.83	3.36	3.51
Duluth, Missabe & Northern	4.34	4.31	4.34	4.31
Duluth, South Shore & Atlantic	3.73	3.95	3.34	3.55
Duluth, Winnipeg & Pacific	3.47	4.01	3.16	3.67
Great Northern	2.88	3.06	2.88	3.06
Green Bay & Western	4.24	4.51	4.24	4.51
Lake Superior & Ishpeming	3.72	3.81	3.72	3.81
Minneapolis & St. Louis	2.14	2.15	1.83	2.04
Minneapolis, St. P. & Sault Ste. Marie	3.49	3.59	3.15	3.08
Northern Pacific	2.51	2.62	2.50	2.61
Oregon-Washington Navigation Company	4.70	4.54	2.51	2.44
Spokane International	5.46	5.24	3.58	3.35
Central Western Region:				
Alton	1.90	2.18	1.84	2.18
Atchison, Topeka & Santa Fe	2.64	2.93	2.59	2.90
Chicago, Burlington & Quincy	1.88	2.12	1.76	2.07
Chicago, Rock Island & Pacific	2.30	2.44	2.13	2.31
Colorado & Southern	2.40	2.58	2.33	2.54
Denver & Rio Grande Western	1.58	1.81	1.58	1.80
Denver & Salt Lake	1.01	1.12	1.01	1.12
Fort Worth & Denver City	4.64	4.85	2.31	2.60
Los Angeles & Salt Lake	3.43	....	3.43	....
Nevada Northern	4.59	4.55	1.78	1.75
Oregon Short Line	3.12	3.16	2.53	2.59
St. Joseph & Grande Island	3.12	3.15	2.62	2.81
Southern Pacific (Pacific lines)	2.93	3.14	2.93	3.14
Toledo, Peoria & Western	2.10	2.35	1.67	1.82
Union Pacific	2.47	2.55	2.45	2.53
Utah	1.03	1.04	1.03	1.04
Western Pacific	2.95	3.01	1.69	1.77
Southwestern Region:				
Fort Smith & Western	2.80	3.16	2.80	3.16
Kansas City Southern	1.98	2.18	1.98	2.18
Kansas, Oklahoma & Gulf	2.12	2.70	1.79	2.70
Midland Valley	1.76	2.58	1.76	2.58
Missouri & North Arkansas	2.86	2.93	2.48	2.55
Missouri-Kansas-Texas lines	2.67	2.80	2.45	2.52
Missouri Pacific	1.84	2.04	1.83	2.01
Oklahoma City-Ada-Atoka	2.42	2.90	2.01	2.90
St. Louis-San Francisco	1.91	2.26	1.88	2.14
St. Louis, San Francisco & Texas	....	4.28	....	3.20
St. Louis Southwestern lines	1.87	1.92	1.04	1.10



Average Regional Costs of Coal and Fuel Oil on Class I Railroads, 10 Months of 1932, as Reported by I. C. C.



Delivered in 1932 by the American Locomotive Company

Locomotives Ordered in 1932

Total of 13 makes last year poorest on record—Builders get no U. S. railway orders for steam locomotives

By Walter J. Taft
Associate Editor, Railway Age

LOCOMOTIVE builders experienced in 1932 the poorest business year on record. Only 12 locomotives—five steam and seven of other types—were ordered last year for domestic service in the United States and only one export order was reported. No railroad in this country placed a steam locomotive order with outside builders; the Great Northern, the only U. S. road to order steam locomotives during the year, placed its order for three of the 2-8-2 type with its own shops.

Since no electric locomotives were ordered the foregoing constitutes the 1932 locomotive business in the United States, the smallest recorded in the accompanying tables which are continuous back to 1901. With business at such a level comparisons with other years are of value only as they serve to dramatize the amazing extent of the decline. The 1932 total of 12, for example, compares with 235 locomotives ordered for domestic service in 1931, and this latter figure, as measured by the number of units ordered, was only 20 per cent of the 1922-1931 average per year. In that decade orders involved average annual purchases of more than 1,000 locomotives. While the factor did not enter in 1932 it should nevertheless be pointed out, in connection with comparisons of the more recent with the more remote years listed in the accompanying compilation, that modern locomotives are far more powerful and far more costly than those of the days when yearly orders totaled thousands.

In Canada for 1932 an export order for one locomotive was reported. Canadian railroads did not order any locomotives during the year. In 1931 the Canadian National purchased an oil-electric and the Canadian Pacific a steam locomotive, the only orders received by the builders in that country during that year. Thus, three locomotives constitute the total business received by Canadian manufacturers since 1930. In 1930 a total of 95 locomotives were ordered in Canada and in 1929 orders for 77 were placed.

The one locomotive ordered in the United States for export last year compares with export orders for 28 in 1931 and 20 in 1930.

The unprecedented business depression, with the accompanying drastic declines in railway traffic and earnings, is, of course, the answer to any inquiry as to why the railways absented themselves from the 1932 locomotive markets. With a continuance of the relative improvement in railway earnings and carloadings noted since September, however, it is but reasonable to be confident that a start toward converting deferred purchases into current orders should not be far away. Thus far in 1933 an order for three Diesel-electric switchers has been reported in the *Railway Age*.

Locomotives built in 1932 for service in the United States, as distinguished from those ordered, totaled 102 as compared with 181 in 1931 and 972 in 1930. This is the lowest total recorded in Table III, which is continuous back to 1905. Of the 1932 locomotives produced for domestic service, 60 were electric locomotives,

Locomotive Orders From 1901 to 1932

the bulk of which were built for the Pennsylvania's New York-Washington electrification project. Canadian builders, in 1932, built three locomotives as compared with 24 in 1931 and 111 in 1930. Locomotives built in the United States for export during 1932 totaled 18 as compared with 17 in 1931 and 51 in 1930.

The distinction between locomotives ordered and the number built should be emphasized. A locomotive is under construction for several months and thus locomotive production figures for any year naturally include some units which were ordered during the closing months of the year previous to that under review. It is this overlap from year to year that results in a total production figure different from the total ordered.

The Car Service Division of the American Railway Association reports monthly totals of locomotive installations and retirements. These figures will not agree with the *Railway Age* totals of locomotives ordered or built, because the Car Service Division total covers only Class I carriers, whereas the *Railway Age* figures cover all carriers, and also industrial users.

The details in the appended list of locomotive orders were supplied by railways and other purchasers in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the co-operation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. The *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tables or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is hoped they meet with entire adequacy.

Table I—Locomotive Orders in 1932

For service in the United States	12
For export to other countries	1
For export from Canada	1
Grand total	14

Table II—Orders for Locomotives Since 1901

Domestic Orders Only

Year	Locomotives	Year	Locomotives
1901	4,340	1908	1,182
1902	4,665	1909	3,350
1903	3,283	1910	3,787
1904	2,538	1911	2,850
1905	6,265	1912	4,515
1906	5,642	1913	3,467
1907	3,482	1914	1,265

Domestic and Foreign

Year	Domestic	Canadian	U. S. Export	Total
1915	1,612	...	850	2,462
1916	2,910	...	2,983	5,893
1917	2,704	...	3,438	6,142
1918	2,593	209	2,086	4,888
1919	214	58	898	1,170
1920	1,998	189	718	2,905
1921	239	35	546	820
1922	2,600	68	131	2,799
1923	1,944	82	116	2,142
1924	1,413	71	142	1,626
1925	1,055	10	209	1,274
1926	1,301	61	180	1,542
1927	734	58	54	846
1928	603	98	27	728
1929	1,212	77	106	1,395
1930	440	95	20	555
1931	235	2	28	265
1932	12	1 (Export)	1	14

Prior to 1918, Canadian orders included under "Domestic."

Table III—Locomotives Built in 1932

	United States	Canada	Total
Domestic	102	2	104
Foreign	18	1	19
Total	120	3	123

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896	866	309	1,176	1912†	4,403	512	4,915
1897	865	386	1,251	1913†	4,561	771	5,332
1898	1,321	554	1,875	1914†	1,962	273	2,235
1899	1,951	514	2,475	1915†	1,250	835	2,035
1900	2,648	505	3,153	1916†	2,708	1,367	4,075
1901	....	....	3,384	1917†	2,585	2,861	5,446
1902	....	....	4,070	1918†	3,668	2,807	6,475
1903	....	....	5,152	1919†	2,162	1,110	3,272
1904	....	....	3,441	1920†	2,022	1,650	3,672
1905*	4,896	595	5,491	1921†	1,185	638	1,823
1906*	6,232	720	6,952	1922†	1,303	231	1,534
1907*	6,564	798	7,362	1923†	3,505	280	3,795
1908*	1,886	456	2,342	1924†	1,810	226	2,036
1909*	2,596	291	2,887	1925†	994	291	1,285
1910*	4,441	314	4,755	1926†	1,585	185	1,770
1911*	3,143	387	3,530	1927†	1,009	167	1,176
				1928†	636	111	747

* Includes Canadian output.
† Includes Canadian output and equipment built in railroad shops.

	United States			Canada			Grand
	Domestic	Foreign	Total	Domestic	Foreign	Total	total
1929	926	139	1,065	96	....	96	1,161
1930	972	51	1,023	111	....	111	1,134
1931	181	17	198	24	....	24	222
1932	102	18	120	2	1	3	123

Locomotive Orders in 1932

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Great Northern	3	2-8-2	Freight	367,000	78,000	29 x 32	May	September	Company Shops
Hill & Suender, Inc.	1	Geared	.....	.....	.....	.....	November	December	Heisler
U. S. Veterans Bureau	1	2-6-0	Freight	112,000	20,300	18 x 24	1932	1932	Baldwin

Export

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Sucession J. Serrales, Porto Rico	1	2-4-2	Freight	33,000	5,190	9 x 12	October	December	Davenport

Canada

Export

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Brazilian Portland Cement Co.	1	2-4-2	.....	35,000	.....	9 x 14	1932	1932	Montreal

Oil-Electric, Gas-Electric or Gasoline Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horse-power	Date of order	Date of delivery	Builder
Cheswick & Harmer	1	0-4-0	Sw.	Oil-Elect.	130,000	530	December	March, '33	West.-Baldwin
Hoboken Mfrs. R. R.	1	0-4-0	Sw.	Gasoline	26,000	100	August	August	Whitcomb-Wauk.
Louisiana Development Co.	1	0-4-4-0	Sw.	Gas-Elect.	90,000	300	1932	.....	West.-F.-R.-H.-Climax
Maine Central	1	0-4-0	Sw.	Gasoline	50,000	150	February	March	Whitcomb-Climax
Steelton & Highspire	1	.....	...	.....	120,000	400	1932	.....	Beth.-Elec.-M.
U. S. Army	1	0-4-0	Sw.	Gas-Elect.	60,000	200	.....	.....	West.-Whitcomb-LeRoi
U. S. Navy	1	0-4-4-0	Sw.	Gas-Elect.	90,000	300	November	December	West.-Atlas-LeRoi

Freight Cars Ordered in 1932

Last year's domestic total of 1,968 lowest on record—Bulk of orders placed in shops of railways and other car users

By Frank W. Kraeger
Associate Editor, Railway Age

FREIGHT cars ordered in 1932 for domestic service in the United States totaled only 1,968, or less than 20 per cent of the 10,880 ordered in 1931, which year 1932 now supplants as the lowest on record. The 1932 total further compares with 46,360 freight cars ordered in 1930 for domestic service, and with 1929 orders for 111,218. In only four others of the years listed in the accompanying table, which is continuous back to 1901, have domestic orders involved purchases of less than 50,000 freight cars and in only 13 years have less than 100,000 been ordered.

Furthermore, the foregoing figures do not measure the extent of the 1932 depression encountered by car builders until it is pointed out in addition that more than 1,600 cars out of last year's domestic total of 1,968 were ordered by railroads and other car users from their own shops. Thus, domestic orders placed with outside builders involved purchases of only about 350 cars. The largest single order of the year was that for 1,285 cars which the Pennsylvania placed with its own shops; the largest single order placed with an outside builder was that of the Northern Pacific for 150 hopper cars. With the exception of two lots of 50 gondola cars each, ordered by the Wheeling & Lake Erie, all other non-shop orders were small.

Table I—Freight Car Orders in 1932

For service in the United States	1,968
For service in Canada	501
For export to other countries	77
Grand total	2,546

Table II—Orders for Freight Cars Since 1901

Year	Domestic Orders Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

Year	Domestic and Foreign Domestic	Canadian	Export	Total
1915	109,792	....	18,222	128,014
1916	170,054	....	35,314	205,368
1917	79,367	....	53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	103,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596
1926	67,029	1,495	1,971	70,495
1927	72,006	2,133	646	74,785
1928	51,200	8,901	2,530	62,631
1929	111,218	9,899	3,023	124,140
1930	46,360	1,936	1,200	49,496
1931	10,880	3,807	151	14,838
1932	1,968	501	77	2,546

Prior to 1918, Canadian orders included in "Domestic."

Table III—Freight Cars Built in 1932

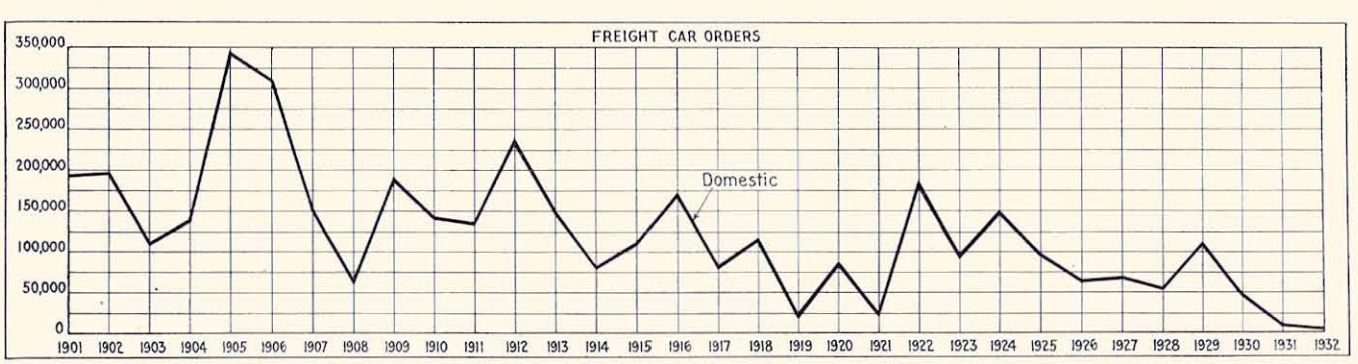
	United States	Canada	Total
Domestic	3,254	....	3,254
Foreign	82	....	82
Total	3,336	....	3,336

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	117,982	1,904	119,886
1900	113,070	2,561	115,631
1901	132,591	4,359	136,950
1902	161,747	2,800	162,599
1903	153,195	1,613	152,801
1904	60,955	1,995	60,806
1905*	162,701	5,305	165,155
1906*	236,451	7,219	240,503
1907*	280,216	9,429	284,188
1908*	75,344	1,211	76,555
1909*	91,077	2,493	93,570
1910*	176,374	4,571	180,945
1911*	68,961	3,200	72,161
1912†	148,357	4,072	152,429

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

Year	United States Domestic	Foreign	Total	Canadian Domestic	Foreign	Total	Grand total
1913	176,049	9,618	185,667	22,017	....	22,017	207,684
1914	97,626	462	98,088	6,453	....	6,453	104,451
1915	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916	111,516	17,905	129,421	....	....	5,580	135,001
1917	115,705	23,938	139,643	3,658	8,100	11,758	151,401
1918	67,063	40,981	108,044	14,704	1,960	16,664	124,708
1919	94,981	61,783	156,764	6,391	30	6,421	163,185
1920	60,955	14,480	75,435	....	....	....	....
1921	40,292	6,412	46,704	8,404	745	9,149	55,853
1922	66,289	1,126	67,415	458	100	558	67,973
1923	175,748	2,418	178,166	....	....	....	....
1924	113,761	1,141	114,902	1,721	....	1,721	116,623
1925	105,935	3,010	108,945	....	....	....	....
1926	88,862	2,771	91,633	1,645	....	1,645	93,278
1927	63,390	1,087	64,477	2,851	....	2,851	67,328
1928	46,060	938	46,998	5,158	....	5,158	52,156
1929	82,240	3,168	85,408	8,557	....	8,557	93,965
1930	75,188	1,909	77,097	6,923	....	6,923	84,020
1931	13,205	409	13,614	4,633	....	4,633	18,247
1932	3,254	82	3,336	....	....	....	3,336



Freight Car Orders From 1901 to 1932

The same depressed conditions overhung the 1932 freight car markets of Canada where only 501 cars were ordered last year for service in that country as compared with 3,807 in 1931 and 1,936 in 1930. With the exception of 1921, when Canadian orders for only 30 freight cars were reported, the 1932 total is the lowest recorded since 1918, the year with which the segregation of Canadian figures in the accompanying compilation commenced.

Freight cars ordered in the United States for export during 1932 totaled only 77, a figure which, like that for domestic U. S. orders, sets a new low record. It compares with export orders for 151 cars in 1931, for 1,200 in 1930 and 3,023 in 1929. Export orders have been segregated in Table II since 1915 and in only three of the 17 years prior to 1932 have fewer than 1,000 cars been involved in foreign business.

The explanation of the depressed freight-car markets of 1932 is, of course, to be found in statistics for railway traffic and earnings. Freight car loadings last year amounted to 28,194,828 cars, the lowest for any year since the compilation of carloading statistics was begun.

Freight cars built during 1932 for domestic service in the United States totaled 3,254, which is also a new low record, comparing with a 1931 figure—the previous low—of 13,205 and with a 1930 total of 75,188. In Canada, during 1932, freight car production was at a standstill; no cars were reported as being built in that country last year. Canadian production in 1931 amounted to 4,633 freight cars and in 1930 a total of 6,923 was built. Production in the United States for export during last year involved the building of 82 cars; this supplants the 1931 total of 409 as the lowest figure in the accompanying compilation which is continuous back to 1899.

The foregoing production figures should not be con-

Freight Car Orders in 1932

For Service in the United States

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Alaska	10	Hopper	100,000	35	0	Steel	56,800	May	August	Gen. Amer. Car
Belle Alkali Co.	1	Tank	30,000	42	3⅜	Steel	29,980	September	September	Am. Car & Fdy.
California Dispatch Line	2	Tank	6,000g.	27	6	Steel	38,400	January	March	Am. Car & Fdy.
	3	Tank	10,000g.	31	6	Steel	55,000	December	Jan., '33	Am. Car & Fdy.
Chesapeake & Ohio	1	Gondola	100,000	40	6	Steel	43,200	April	August	Am. Car & Fdy.
Diamond Alkali Co.	1	Tank	30,000	42	3⅜	Steel	31,700	June	June	Am. Car & Fdy.
Elgin, Joliet & Eastern	144	.....	.....	.....		....	.....	1932	1932	Company Shops
Fleischmann Transportation Co.	7	Tank	100,000	.....		Steel	.....	.....	1932	Company Shops
General Chemical Co.	1	Tank	6,784g.	28	9¼	Steel	55,900	February	March	Am. Car & Fdy.
	2	Tank	80,000	36	6¼	Steel	28,780	March	July	Am. Car & Fdy.
General Electric Co.	2	Transformer	260,000	21	6	Steel	200,000	.....	1932	Company Shops
Hauser Construction Co.	2	Air Dump	80,000	22	6	Steel	55,000	February	February	Magor
Hill & Suender, Inc.	9	Air Dump	60,000	25	4	Steel	41,100	April	June	Koppel
Kansas City Southern	25	Gondola	140,000	45	0	Steel	53,000	March	August	Company Shops
Mathieson Alkali Works, Inc.	5	Tank	80,000	.....		Steel	62,000	March	June	Gen. Amer. Tank
	2	Box	80,000	39	8	Steel	41,300	February	June	Am. Car & Fdy.
Merchants Despatch, Inc.	5	Refrigerator	70,000	33	2	St. Und'frame	60,500	January	January	Company Shops
	12	Refrigerator	70,000	33	2	St. Und'frame	59,400	April	May	Company Shops
	15	Refrigerator	70,000	33	2	St. Und'frame	58,000	May	June	Company Shops
	4	Refrigerator	70,000	33	2	St. Und'frame	59,300	November	December	Company Shops
Monsanto Chemical Wks.	1	Tank	30,000	42	3⅜	Steel	30,800	February	February	Am. Car & Fdy.
National Huckster Co.	1	Poultry	60,000	36	6	St. Und'frame	41,000	December	Feb., '33	Am. Car & Fdy.
Niagara Alkali Co.	1	Tank	8,000g.	36	3	Steel	42,100	April	May	Am. Car & Fdy.
Norfolk & Western	4	Tank	16,000g.	.....		Steel	.....	1932	1932	Company Shops
North American Car Corp.	6	Tank	4,500g.	32	6¼	Steel	38,300	June	August	Am. Car & Fdy.
	4	Tank	80,000	.....		Steel	38,000	.....	February	Am. Car & Fdy.
	5	Tank	80,000	.....		Steel	38,000	.....	February	Am. Car & Fdy.
	1	Refrigerator	20,000	19	10	Steel	27,000	.....	November	Company Shops
Northern Pacific	150	Hopper	100,000	34	9	Steel	44,300	January	May	Pressed Steel
Ohio Gravel Co.	1	Air Dump	80,000	25	8	Steel	52,000	January	February	Koppel
Pacific Fruit Express	100	Refrigerator	140,000	50	5	Steel Frame	86,600	February	September	Company Shops
Pennsylvania	925	S. S. Box	100,000	40	6	Steel Frame	46,500	October	April, '33	Company Shops
	250	S. S. Box	100,000	40	6	Steel Frame	52,300	October	April, '33	Company Shops
	60	S. S. Box	100,000	50	6	Steel Frame	58,300	October	April, '33	Company Shops
	50	S. S. Box	100,000	50	6	Steel Frame	59,000	October	April, '33	Company Shops
Roessler & Hasslacher	1	Tank	8,000g.	36	9	Steel	49,896	February	April	Am. Car & Fdy.
St. Louis-San Francisco	8	.....	.....	.....		....	.....	1932	1932	Company Shops
Shell Oil Company	1	Tank	11,233g.	39	3	Steel	72,700	June	June	Gen. Amer. Tank
Sylvania Ind. Corp.	1	Tank	6,000g.	31	10	Steel	41,200	October	December	Am. Car & Fdy.
Thunder Bay Quarries Co.	4	Air Dump	100,000	25	2¾	Steel	65,700	January	March	Koppel
Union Tank Car Co.	5	Tank	100,000	40	5	St. Und'frame	69,700	May	August	Graver T.& M.C.
	10	Tank	100,000	42	11	St. Und'frame	84,400	April	August	Struther-Wells
U. S. Navy	7	Flat	100,000	40	0	Steel	37,000	January	February	Koppel
	1	Flat	60,000	.....		Steel	.....	July	September	Haffner-Thrall
	1	Box	100,000	.....		Steel	.....	July	September	Haffner-Thrall
	3	Flat	100,000	40	0	Steel	42,700	July	September	Koppel
	2	Box	100,000	.....		Steel	.....	October	Jan., '33	Gen. Amer. Car
U. S. Potash Co.	12	Gable Bottom	50,000	21	6	St. Und'frame	21,049	September	November	Magor
Wheeling & Lake Erie	50	Gondola	140,000	66	6	Steel	64,000	May	September	Canton Car
	50	Gondola	140,000	66	6	Steel	64,000	November	Jan., '33	Canton Car

Export

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Canadian Industries, Ltd.	1	Tank	30,000	.....		....	.....	1932	1932	Am. Car & Fdy.
	1	Tank	2,717g.	.....		....	.....	1932	1932	Am. Car & Fdy.
F. al Pacifico de Costa Rica	50	S. S. Box	46,000	30	0	Steel Frame	.....	November	Jan., '33	Gregg
	*9	Stock	.....	.....		....	.....	1932	1932	Company Shops
	*2	Caboose	.....	.....		....	.....	1932	1932	Company Shops
Interoceanic Ry. of Mexico, Ltd.	*1	.....	.....	.....		....	.....	1932	1932	Company Shops
Lone Star Cement Co.	25	Car Bodies	60,000	37	9	Steel	30,600	May	August	Standard Steel
Mexican Railway	*4	Caboose	.....	.....		....	.....	1932	1932	Company Shops
National Rys. of Mexico	*34	.....	.....	.....		....	.....	1932	1932	Company Shops
	*16	.....	.....	.....		....	.....	1932	1932	Company Shops

Canada

Purchaser	No.	Class	Capacity	Length ft.	Length in.	Construction	Weight	Date of order	Date of delivery	Builder
Canadian National	500	Gondola	140,000	.....		....	.....	1932	.....	Eastern Car
Lake Shore Mining Co.	1	Air Dump	30 cu. yd.	.....		....	.....	1932	1932	National Steel

*Not included in totals.

fused with the totals of orders placed. Nor should they be compared with the figures on the number of cars installed as reported in the statistics issued monthly by the Car Service Division of the American Railway Association. This latter includes only installations on Class I roads, whereas *Railway Age* figures include the production of all cars for the railroads as well as private car lines.

The appended tables contain a detailed statement of orders placed for new freight cars or those having new bodies during 1932 by railroads and industrial concerns; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of cars, in response to requests for this information. The data thus furnished were then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The production figures were secured in response to requests to the car builders for this information. As in former years the *Railway Age* is especially indebted to the American Railway Car Institute for its kindness in making available reports of the companies affiliated with that organization.

The *Railway Age* is not sufficiently optimistic to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly as concerns comparison with preceding years which, after all, is the primary purpose of the compilations.

Passenger Car Orders in 1932

Reading order for 30 multiple-unit cars brings total to 39, well above last year—No export or Canadian orders

By Gardner C. Hudson
Associate Editor, Railway Age

As a result of a single order for 30 multiple-unit cars placed with the Bethlehem Steel Company early in the year by the Reading Company, passenger-train cars were the one major type of railway equipment purchased in larger volume in 1932 than in 1931. The Reading order—the largest for passenger equipment since 1930—included 28 passenger cars and two passenger and baggage cars, all for use in electrified service in the suburban territory surrounding Philadelphia, Pa. Nine other passenger-train cars were ordered from builders or from railroad shops throughout the country, bringing the total for the year 1932 to 39. This figure does not, however, include rail motor cars, which are considered in a separate article elsewhere in this issue.

The year's total of 39 is nearly four times as large as the domestic orders for 11 cars reported in 1931, but is still small enough to make 1932 the third lowest year on record from the standpoint of passenger-train car orders, 1918 being the only other twelve-month period when orders for less than 200 cars have been reported. Naturally, too, the 1932 total is far below the average of 1,676 cars purchased in the five years from 1926 to 1930, inclusive.

Table I—Passenger Car Orders of 1932

For service in the United States	39
For service in Canada	...
For export to other countries	...
Grand total	39

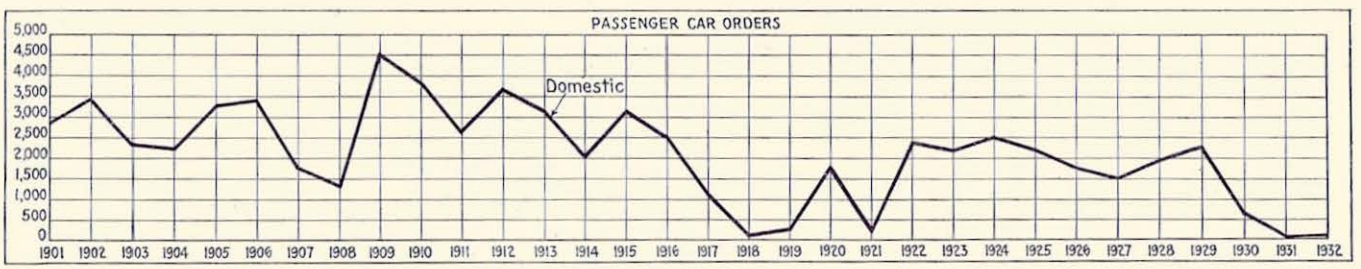
Table II—Orders for Passenger Cars Since 1901

Domestic Orders Only

Year	Passenger cars	Year	Passenger cars
1901	2,879	1909	4,514
1902	3,459	1910	3,881
1903	2,310	1911	2,623
1904	2,213	1912	3,642
1905	3,289	1913	3,124
1906	3,402	1914	1,674
1907	1,791	1915	1,978
1908	1,319		

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1916	2,302	...	109	2,411
1917	1,124	...	43	1,167
1918	9	22	26	57
1919	292	347	143	782
1920	1,781	275	38	2,094
1921	246	91	155	492
1922	2,382	87	19	2,488
1923	2,214	263	6	2,483
1924	2,554	100	25	2,679
1925	2,191	50	76	2,317
1926	1,868	236	58	2,162
1927	1,612	143	48	1,803
1928	1,930	334	29	2,293
1929	2,303	122	33	2,458
1930	667	203	15	885
1931	11	11	21	43
1932	39	...	...	39



Passenger Car Orders From 1901 to 1932

The relatively low total for 1932 is not at all surprising, however, in view of the continuance of adverse economic conditions and the continued decline in railway passenger traffic. Generally speaking, the railroads have been giving their attention to improvements or refinements—such as air-conditioning; improved seating, and the like—in existing passenger rolling stock rather than to the purchase of new equipment.

For the first time since these records have been separately compiled by the *Railway Age* and its predecessors, no passenger cars were ordered in the United States for export to foreign countries; and, for the first time since 1917, no cars were ordered from Canadian builders for use either in Canada or elsewhere. This complete absence of export purchases is in sharp contrast to orders for 21 cars for use abroad placed in the United States in 1931 and to average orders for this purpose of 37 cars for each of the five years between 1926 and 1930, inclusive; while the absence of Canadian orders contrasts even more sharply with orders for 11 cars placed in that country in 1931 and with average annual orders of 208 cars during the five year period 1926-1930.

Passenger-train cars built in the United States for domestic service during 1932 numbered 39, the lowest figure on record, about one-fifth of the 198 cars built for domestic use in 1931. Production for export, like export orders, was at a complete standstill, also for the first time in these records; while there was, likewise, no production of passenger-train cars in Canada, either for Canadian use or for export. The same situation with respect to Canadian building has existed in three prior years—1920, 1923 and 1925.

The list of orders which follows, amplifying the summary tables published herewith, has been compiled in the usual way, returns from railroads being checked against lists of orders supplied by the car builders, largely through the courtesy of the American Railway Car Institute. Unless otherwise noted, construction is assumed to be all-steel.

Table III—Passenger Cars Built in 1932

	United States	Canada	Total
Domestic	39	...	39
Foreign	...	...	...
	39	...	39

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	1,201	104	1,305
1900	1,515	121	1,636
1901	1,949	106	2,055
1902	From 1902 to 1907		1,948
1903	passenger car figures		2,007
1904	in these two columns		2,144
1905*	included in corre-		2,551
1906*	sponding freight car		3,167
1907*	columns.		5,457
1908*	1,645	71	1,716
1909*	2,698	151	2,849
1910*	4,136	276	4,412
1911*	3,938	308	4,246
1912†	2,822	238	3,060

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

	United States			Canadian			
Year	Domestic	Foreign	Total	Domestic	Foreign	Total	Grand total
1913	2,559	220	2,779	517	...	517	3,296
1914	3,310	56	3,366	325	...	325	3,691
1915	1,852	14	1,866	83	...	83	1,949
1916	1,732	70	1,802	37	...	37	1,839
1917	1,924	31	1,955	45	...	45	2,000
1918	1,480	92	1,572	1	...	1	1,503
1919	306	85	391	160	...	160	551
1920	1,272	168	1,440	...	...	...	1,440
1921	1,275	39	1,314	361	...	361	1,675
1922	676	144	820	71	...	71	891
1923	1,507	29	1,536	...	...	...	1,536
1924	2,150	63	2,213	167	...	167	2,380
1925	2,363	50	2,413	...	...	...	2,413
1926	2,184	102	2,286	285	...	285	2,571
1927	1,785	50	1,835	126	...	126	1,961
1928	1,356	15	1,371	237	...	237	1,608
1929	1,254	20	1,274	162	...	162	1,436
1930	1,264	40	1,304	210	...	210	1,514
1931	198	21	219	66	...	66	285
1932	39	...	39	...	...	...	39

Passenger Car Orders in 1932

For Service in the United States

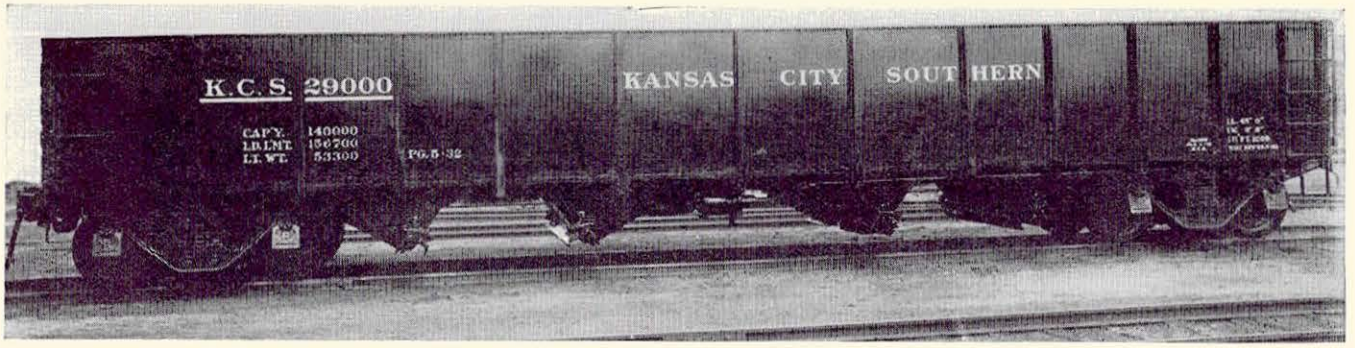
Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Chicago, Burlington & Quincy	4	Baggage	.....		..	.....	1932	1932	Company Shops
Chicago Great Western	2	Exp.-Refrig.	42	6	..	88,700	1932	1932	Pullman
Reading	28	M. U. Coaches	63	0	86	127,000	January	December	Bethlehem
	2	M. U. P. & B.	63	0	62	.....	January	December	Bethlehem
St. Louis-San Francisco	1	.....	.....		..	.....	1932	1932	Company Shops
San Francisco, Napa & Calistoga	2	Coach Bodies	54	6	50	98,000	December	Feb. '33	St. Louis Car

Export

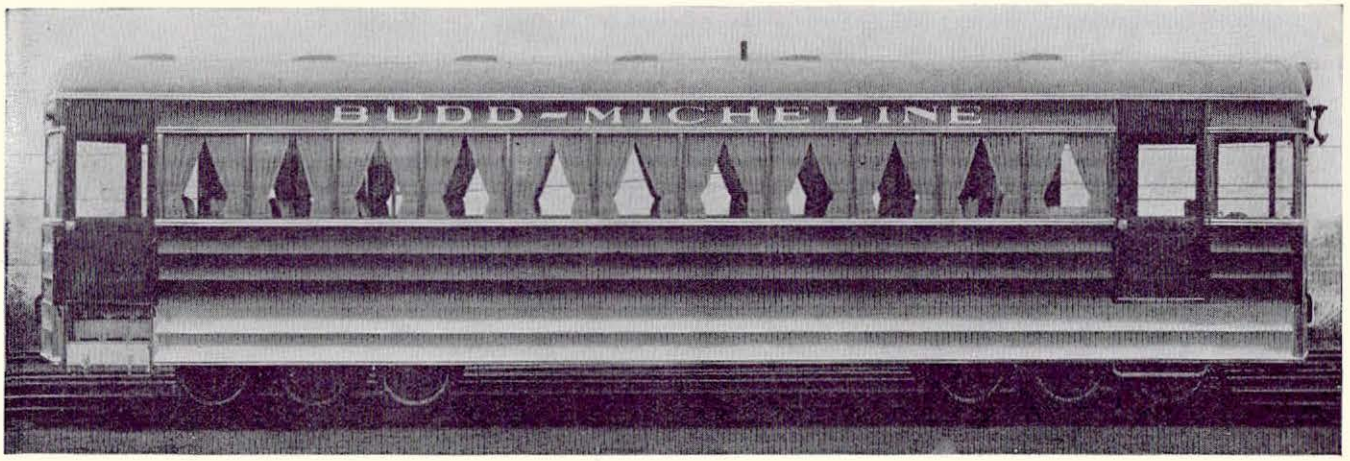
Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
F. al Pacifico de Costa Rica	*2	.....	.....		..	.....	1932	1932	Company Shops
National Rys. of Mexico	*9	.....	.....		..	.....	1932	1932	Company Shops
	*15	.....	.....		..	.....	1932	1932	Company Shops

* Not included in totals.

* * * *



All-Welded Steel Hopper Car With General Steel Castings One-Piece Steel Underframe



The First Stainless Steel Rubber Tired Rail Car

Rail Motor Cars Are Still in Demand

Orders were placed for 19 cars in United States and Canada in 1932—Stainless steel and pneumatic tires enter the field

By C. B. Peck
Mechanical Department Editor, Railway Age

THE steam railroads of the United States and Canada during 1932 placed orders with builders for 14 rail motor cars and one trailer. Four additional motor cars for a narrow gage line were built in company shops. Orders for export were received from Cuba for two cars and the power equipment for a third.

Nineteen-Thirty-Two was the third successive year in which a new low in motor-car orders was established. In 1930 orders were placed for 52 motor cars for use in the United States and Canada and three for export, and in 1931 the figures were 30 and 10, respectively. In view of the general paralysis in the other equipment markets, however, the 1932 motor-car orders indicate a persistent demand for this low-cost type of railway passenger equipment.

Orders for Rail-Motor Cars and Trailers

For service in	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932
U. S.	51	77	120	149	142	180	175	132	54	26	15
Canada	7	3	12	7	4	9	10	10	8	4	4
For export	1	22	..	34	32	12	9	28	3	10	2
Total	59	102	132	190	178	201	194	169	65	40	21
Motor cars	50	93	112	171	161	176	172	159	56	40	20
Trailers	9	9	20	19	17	25	22	11	9	..	1

In March of last year the combination of lightweight construction and pneumatic tires was first demonstrated to American railway men on American rails. Within the remainder of the calendar year three railroads had ordered four motor cars and one trailer of this type embodying the most radical departure from conventional ideas of railway equipment ever made in a single step. The position of these cars in the table classifying cars according to power-plant capacity and weight clearly indicate how widely they depart from the trend of motor-car development during the past eight years.

Although self-propelled rail motor cars were used with considerable success on several railroads nearly 25 years ago, their use never spread beyond a relatively few installations. The present development of self-propelled rail cars has practically all taken place since 1922. During that entire period power-plant capacity and weight have steadily increased, as shown in the tables. In 1922 the rail-motor car was largely a product of truck manufacturers who, as the result of the close of the World War, found themselves without their normal market. The cars built during that year provided seats for from 35 to 45 passengers, with weights in most cases between 20,000 and 30,000 lb. The weights per passenger seat

Power-Plant Capacity of Rail-Motor Cars, U. S. and Canada

Horsepower										
Over	To and incl.	1925	1926	1927	1928	1929	1930	1931	1932
...	100	13	14	2	5	6	2	..	5*
100	125	5	7	..	1	3	..	..	3
125	150	9	..	..	4	1	..	..	..
150	175	20	1	..	1	..	..	..	..
175	200	49	3	3	1	..	..	..	..
200	250	36	65	43	13	2	..	..	..
250	300	2	26	76	64	15	7	1	..
300	350	2	..	..	30	2	2	..	..
350	400	..	..	..	18	64	25	22	6
400	450	..	8	7	6	2	..	1	..
450	500	..	11	1	4	5	..	..	..
500	...	..	..	8	15	30	17	6	4
Unclassified		..	..	24	1	2	..	..	..

* Four are small cars for a 3-ft. gage line

ranged from about 400 lb. to 700 lb. Ten years later the weights per passenger seat of several 400-hp. cars ranged from 1,600 to 1,900 lb.*

With the beginning of the second decade of rail motor car service, in the new development of light-weight units carried on rubber tires, the weight per seated passenger has been restored to that which prevailed in 1922. Then, as now in the case of the new light-weight vehicles, the emphasis was on branch-line service. With surprising rapidity, however, the earlier rail cars developed beyond the light branch line; power-plant capacity and weight increased until these cars have assumed the functions of motive power for hauling several standard railway coaches. While the steady decline in the number of cars ordered during the past three years may throw some doubt on what would have been the trend as to weight and horsepower capacity under less abnormal business conditions, the analysis suggests that the increase is slowing up, if it has not halted, with cars of about 400 hp. and weighing between 125,000 and 150,000 lb. in greatest demand.

The future of the light-weight vehicle embodying the easy-riding characteristics imparted by the rubber tires which, during the past year, was so quickly put to a practical test will be interesting to watch for the next few years. Will it be confined to the light branch-line service for which, it is being advocated? Will its development repeat the 1922 to 1929 trend? Will it influence the future development of the passenger car for use with steam motive power?

Following is a list of the orders for rail-motor cars placed with builders in the United States and Canada during 1932:

Comparison of Rail-Motor Weights, U. S. and Canada

Weights, lb. Over	To and incl.	1925	1926	1927	1928	1929	1930	1931	1932
.....	25,000	6	7	..	3	3	..	..	8*
25,000	50,000	19	7	..	4	6	..	..	1
50,000	75,000	74	2	4	4	..	2	..	..
75,000	100,000	27	79	29	16	5	..	..	..
100,000	125,000	9	32	88	62	20	2	..	..
125,000	150,000	..	5	21	58	54	29	25	4
150,000	175,000	..	..	..	11	24	13	4	1
175,000	.....	..	1	..	..	7	..	1	4
Unclassified		..	..	26	5	13	7	..	..

* Four are small cars for a 3-ft. gage line

* In making these comparisons the actual number of seats has been increased, in cases where extensive baggage rooms are included, by the number of seats which could be placed on the baggage-room floor space.

Orders for Rail Motor Cars and Trailers

For Service in the United States

Purchaser	No.	Motor or Trailer	Type of power plant	Horse-power	Seating capacity	Length of bagg. compt. Ft.	In.	Weight	Builders
Chicago Great Western	4	Motor	Gas-Electric	600	..	†61	0	178,000	Elec.-M.-West.-Pullman
	1	Motor	Gas-Electric	400	22	18	4¾	156,300	Stand. S.-West.-Sterl.
Georgia Northern	1	Motor	Gasoline	75	25	15	0	20,000	Edwards Ry. M. Car
Pennsylvania	1	Motor	Oil-Electric	125	30	10	6	25,000	Cummings-G. E.-Budd
	1	Motor	Oil-Electric	125	46	.....		25,000	Cummings-G. E.-Budd
Reading	1	Motor	Oil-Electric	125	47	.....		22,000	Cummings-West.-Budd
‡Rio Grande Southern	1	Motor	Gasoline	40	6	.....		5,300	Company Shops
	1	Motor	Gasoline	50	7	.....		10,300	Company Shops
	1	Motor	Gasoline	50	9	.....		14,800	Company Shops
	1	Motor	Gasoline	50	9	.....		15,200	Company Shops
Texas & Pacific	1	Motor	Gas-Electric	400	..	36	0	45,000	A.LaFrance-West.-Budd
	1	Trailer	.....	...	65	.....		30,000	Budd
Export									
Consolidated R. R. of Cuba	2	Motor	Gasoline	85	56	7	0	31,500	Brill-Hall-Scott
United Rys. of Havana	*1	Motor	Gasoline	59	32	.....		16,970	Co. Shops-Intern. M. Co.
Canada									
Canadian Pacific	2	Motor	Gas-Electric	400	..	†60	0	150,000	Elec.-M.-West.-Ottawa Car
	2	Motor	Gas-Electric	400	25	31	5	144,200	Ottawa Car

‡ Three-foot gauge
* Not included in totals.
† Includes 30-ft. mail compartment.

Three Years of Under-Maintenance

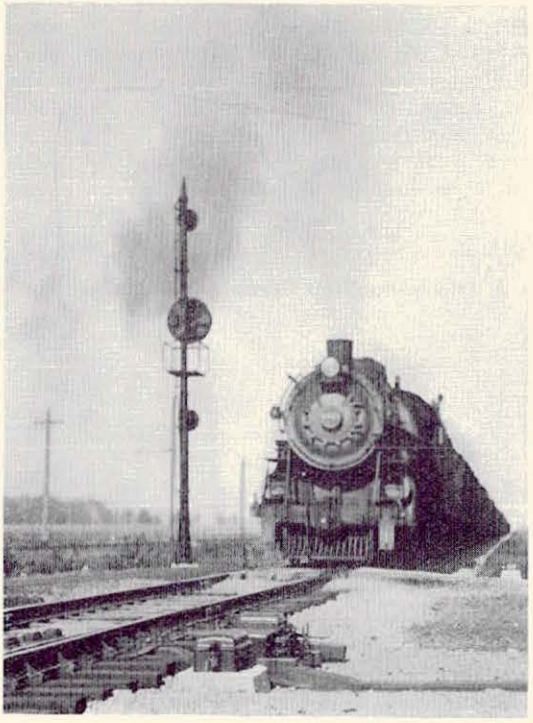
(*Continued from page 152*)

that which has taken place with respect to locomotives and freight cars, there is evidently a considerably larger proportion of deferred maintenance in the case of passenger equipment than in either of the other two classes of equipment. This is causing increasing shabbiness and not affecting safety in train service.

The steady decline in the demand for locomotives and freight cars which has taken place progressively during the last three years has made possible a steady increase in the rate at which deferred maintenance of equipment has been accumulating without seriously affecting the quality of the service. With the decline in demand stopped, however, the ability to continue a program which provides only half the material needed to restore current wear and tear will soon cease. With a definite increase in traffic not only will the current requirements have to be met, but also the accumulated deferred maintenance will have to be caught up rapidly. This will be done partly through enlarged maintenance programs and partly through increased retirements and replacements.

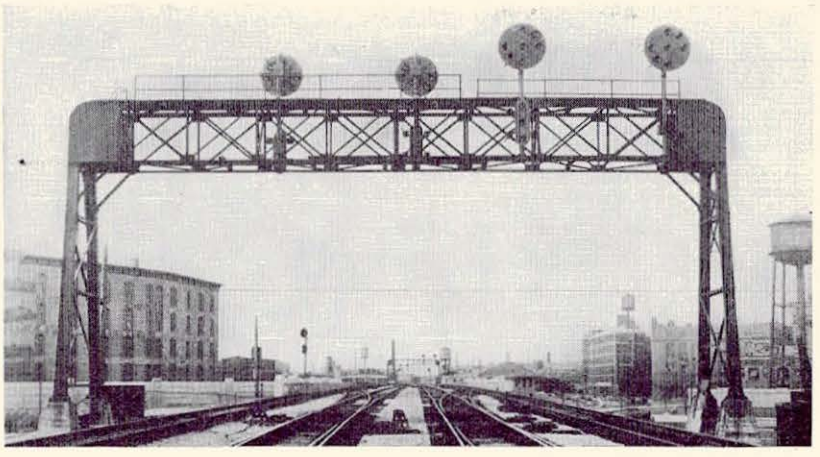
NOTE ON EQUIPMENT PRICES.—The principal source of information on the prices paid for cars and locomotives is the decisions of the Interstate Commerce Commission granting authority for the issuance of equipment trust certificates. Since such authorizations in 1932 shrank almost to zero, and since the range of equipment purchased during the year was too narrow to indicate trends of real statistical value, the customary article on prices of cars and locomotives is omitted from the Annual Statistical Number this year.—EDITOR.

Signal Construction During 1932



On C. T. C. Territory on the Baltimore & Ohio

Programs confined to projects effecting immediate savings in operating expenses—Facilities completed total only 25 per cent of those for previous year



Consolidated Interlocking at Dayton, Ohio

By J. H. Dunn
Signaling Editor,
Railway Age

THE volume of signaling construction on the railroads of the United States and Canada during 1932 set a low mark in comparison with past records, a total of only 2,983 units being placed in service as compared with 11,349 in the previous year and 14,343 units as the annual average for the four years prior to 1932. In this comparison one unit of value is allowed for each automatic signal, highway crossing signal, interlocking or remote control lever, power switch, car retarder, etc., as shown in the table. Excepting for one extended signal installation and a few large interlockings at terminals, new construction during 1932 was limited to comparatively small projects which were installed because the immediate savings to be effected in operating expenses were sufficient to show a liberal return on the expenditures required.

Comparison of Annual Signaling Construction

Number of Units Completed Each Year	1928	1929	1930	1931	1932
Automatic Block Signal	5,680	8,061	7,320	3,501	617
Highway Crossing Signals	2,271	2,505	2,984	2,368	883
Levers of Interlocking	2,395	2,170	2,707	2,701	768
Levers of Remote and Centralized Control	312	584	839	653	93
Power-Operated Switches in Remote and Centralized Control	136	309	607	412	63
Signals Controlled in Remote and Centralized Control	600	1,150	1,517	883	139
Signals in Automatic Interlockings	160	328	503	410	236
Spring Switches	153	135	152	122	57
Levers Added at Rebuilt Plants	455	403	619	162	124
Number of Retarders	53	221	98	41	3
Power Switches in Retarder Yards	86	357	153	96	...
Total	12,301	16,223	17,499	11,349	2,983

Among the bright spots of the year may be mentioned the fair-sized programs of automatic interlockings, including 35 plants, highway crossing protection involving 883 signals, and remote and centralized control including 61 switches and 139 signals as well as 57 spring switches. However, the volume of regular interlocking, including only 30 plants, and automatic block signal construction of 190 miles in 1932, dropped to such low totals as not to be comparable with any past records since signaling became of importance on the railroads more than 25 years ago. The previous low record was established in 1920 when 546 miles of automatic block signaling was installed, which mileage was 356 in excess of that in 1932.

Car-retarder construction was practically at a standstill during 1932, one new installation involving one retarder being completed at an industrial plant while three retarders were added to an existing installation. No new automatic train control installations were made, but, on the contrary, the Interstate Commerce Commission has, at the requests of certain roads, permitted some installations to be removed from service. The bright spot in this picture is that several roads are planning to continue and even extend the operation of cab signaling.

During 1932, the Pennsylvania extended cab signaling on 11 miles of road, including 29.4 miles of track between Manhattan Transfer and Sunnyside Yard.

Automatic Block Signaling

In 1932 automatic block signals were placed in service on 190 miles of road, as compared with 1,385 miles during the previous year. The Atchison, Topeka & Santa Fe made the most extensive installation of automatic signals on 95 miles of track, the remaining 95 miles being split up in short sections on 17 other roads. Of the 617 signals installed, 264 were in the subways in New York; of those installed on steam roads, 26 were semaphore, 322 color-light and 5 position-light type. However, the volume of construction was so limited that the statistics reveal no trends as to the more general use of certain types of signals or systems of power supply.

Table A—Automatic Block Signals Completed During 1932

Road	Location	Miles of Road	Number of Signals	Manufacturer
Alton	Corwith, Ill., to Pan-Handle Xing	1.3d	2s 1c	GRS
A. T. & S. F.	Raton, N. Mex., to Dillon	3.0s	2s	Union
	Jansen, Colo., to Starkville		2s 1c	Unoin
	Barstow, Cal., to Mojave	71.8s	119c	Union
	Joseph City, Ariz., to D. T. Junction	23.5s	33c	Union
B. of T. C. of N. Y.	42nd St., New York, to Roosevelt Ave. and Nassau Ave., to Queens Ave	....	264c	GRS
B. & M.	Tower H, Boston, Mass., to West Cambridge	2.5d	6c	GRS
	West Cambridge, Mass., to Fresh Pond	0.8d	1c	GRS
	Hill Crossing, Mass., to Waltham	4.0d	6c	GRS
C. N.	Detroit, Mich., to Royal Oak	8.8d	12c	Union
	Pontiac, Mich., to Pontiac	1.4d	5c	Union
C. P.	Vancouver, B. C.	1.2s	5c	GRS
C. & O.	Orina, Va., to Williamsburg	14.0d	19c	Union
D. L. & W.	Plymouth Jct., Pa., to West Nanticoke	5.0d	10s	Union
	Elmira, N. Y.	1.3d	1c	Union
Ft. W. & D. C.	Childress, Tex., to FW. & DN. Jct.	3.7s	6c	.....
	Ft. Forth, Tex., Through Yards	0.7s	3c	.....
	Wichita Falls, Tex., Through Yards	....	1c	.....
M. P.	Belt Jct., Tex., to Gulf Coast Jct.	2.0s	5c	GRS
N. Y. C.	Woodlawn, N. Y., to Mt. Vernon	1.2f	8c	GRS
	Mt. St. Vincent, N. Y., to Yonkers	2.5f	10c	GRS
	Dobbs Ferry, N. Y., to Tarrytown	4.7f	20c	GRS
N. Y. O. & W.	Middletown, N. Y.	3.0d	8c	Union
P. E.	Vineyard, Cal., to Beverly Hills	4.6d	1c	Union
Penn.	Jersey City, N. J., to Journal Sq.	1.9d	5p	Union
	Seaford, Del., to Bethel	3.1d	2s 4c	Union .....
	Clairton, Pa., to Dravosburg	6.0d	8s	.....
Reading	Shawmont, Pa., to Norristown	8.8d	22c	Union
	Fishers, Pa., to Chestnut Hill	5.1d	18c	Union
S. A. L.	Columbia, S. C., to Cayce	2.5s	4c	Union
S. P.	Fresno, Cal.	1.0d	3c	Union
	Totals	108.4s	26s	
		72.6d	586c	
		8.4f	5p	
		189.4	617	

Legend—
In "Miles of Road" column; s = Single track, d = Double track, f = Four tracks.
In "No. of Signals" column; s = Semaphore, c = Color-light p = position-light.

Interlocking During 1932

The interlocking construction program for 1932 included 30 new plants, involving 768 levers, as compared with 110 new plants including 2,701 levers in 1931. Of the plants completed last year, 11 were mechanical, 13 electric, 5 electro-pneumatic, and 1 electro-mechanical. At 18 other plants, which were rebuilt, a total of 124 new levers were added, making a total of 892 new levers of interlocking installed during 1932. In addition, a considerable number of old plants were overhauled, semaphores being replaced with light signals, electric locking being installed, etc., as a part of the improvement program.

One of the important interlockings completed during the past year was that at the Dayton Union Terminal, this plant being of the C.T.C. type, the new interlocking with one control machine handling an entire terminal layout which formerly involved five interlockings and several layouts requiring switch tenders. A C.T.C. installation of a similar nature was made by the Nickel Plate at Toledo to handle a yard and terminal layout. The arrangement of the equipment and the circuits developed for these plants were an excellent example of the results of continued effort toward simplicity and facility of operation.

Table B—Interlocking Plants Completed During 1932

Road	Location	Manufacturer	Lever Capacity of Frame	Working Levers: Mechanical	Electric	Electric Pneumatic	Elec.-Mech.: Mech.	Elec.
A. C. L.	Station, N. C.	Union	4	4	..	..	..	..
	Columbia, S. C.	Union	4	4	..	..	..	..
B. of T. C. of N.Y.	Roosevelt Ave., N. Y.	GRS	48	..	60	..	..	..
	Lexington Ave., N. Y.	GRS	24	..	17	..	..	..
	Nassau Ave., N. Y.	GRS	24	..	15	..	..	..
	Court Sq., N. Y.	GRS	32	..	25	..	..	..
	Queens Plaza, N. Y.	GRS	44	..	36	..	..	..
	36th St., N. Y.	GRS	28	..	24	..	..	..
	Nor. Blvd., N. Y.	GRS	12	..	8	..	..	..
	145th St., N. Y.	Union	..	..	..	10	..	..
	145th St., N. Y.	Union	..	..	..	14	..	..
	135th St., N. Y.	Union	..	..	..	33	..	..
B. & O.	Clifton Jct., N. Y.	GRS	32	..	32	..	..	..
C. & O.	Old Point Jct., Va.*	GRS	..	..	1	..	..	..
	BK Cabin, W. Va.	Union	4	4	..	..	..	..
	South Ruffner, W. Va.	Union	20	20	..	..	..	..
	Greenway, Va.*		..	..	1	..	..	..
C. B. & Q.	Chicago	GRS	144	..	140	..	..	..
D. U. T.	Dayton, Ohio	GRS	..	..	154	..	..	..
L. T. C.	Levis, Que.	GRS	4	4	..	..	..	..
L. & N.	Mayton, Tenn.*	Union	19	..	..	11	..	..
	Cumberland River Draw*	GRS	32	..	23	..	..	..
	Tennessee River Draw*	GRS	..	..	..	..	4	2
M-K-T	Boonville, Mo.	Union	..	..	3	..	..	..
M. P. I.-G. N.	Magnolia, Tex.		2	2	..	..	..	..
H. B. & T.	Houston, Tex.*	GRS	..	..	2	..	..	..
N. Y. C.	Harmon, N. Y.*	GRS	128	..	9	..	..	..
B. & A.	Chatham, N. Y.*		60	2	..	..	..	..
N. Y. C. & St. L.	Thornton Jct., Pa.	Union	2	..	..	..	2	2
	Gould, Ohio	Union	36	..	27	..	..	..
Penn.	Philadelphia, Pa.	Union	131	..	..	74	..	..
	Gwynns Run, Md.	Union	47	..	..	31	..	..
	Baltimore (Union Jct.), Md.*	Union	..	..	..	5	..	..
	Odenton, Md.*	Union	..	..	..	..	..	2
	Lancaster, Pa.*	Union		..	..	7	..	..
	Thorndale, Pa.*	Union	11	..	..	7	..	..
	Camden (Centre), N. J.*	Union	..	..	..	7	..	..
	Paoli, Pa.*	Union	..	..	..	..	6	2
	Wilmerding, Pa.*	Union	..	..	..	7	..	..
	Brownsville, Pa.*	Union	21	21	..	..	..	..
	Toledo, Ohio*	Union	..	3	..	..	..	..
P. M.	Grand Rapids, Mich.	GRS	4	..	4	..	..	..
	Detroit, Mich.*		..	2	..	..	..	..
S. A. L.	Parrishville, S. C.	Union	4	4	..	..	..	..
	Barrelville, S. C.	Union	4	4	..	..	..	..
	Heath, S. C.	Union	4	4	..	..	..	..
	Dupont, S. C.	Union	4	4	..	..	..	..
	West Palm Beach, Fla.	Union	4	3	..	..	..	..
	Levers New			57	545	162	2	2
	Levers Added			28	36	44	10	6
	New Plants 30							
	New Levers 768							
	Rebuilt Plants 18							
	Rebuilt Levers ... 124							

* = Existing plant at which additional levers were added and in many cases entire plant rebuilt.

In spite of, but more probably because of, the times, the construction of automatic interlockings continued at a fairly good rate, 35 such plants being completed in 1932, as compared with 62 the previous year. The new plants placed in service during 1932 included 236 signals,

1 movable-point frog and 1 power-operated switch. In most cases these automatic interlockings replaced mechanical plants, the savings effected by eliminating operators being sufficient to pay for the improvement in from one to three years.

Remote and Centralized Control

In the field of centralized traffic control, including remote control, the construction was very limited during 1932, only 20 installations, involving 61 power switches and 139 signals, being placed in service, as compared with 64 installations involving 412 power switches and 883 signals in 1931. None of the C.T.C installations completed in 1932 involved much mileage, the more important projects involving the consolidation of the control of two or more interlockings, such as that at Waltham, Mass., on the Boston & Maine, including 21 switches, or that at Walbridge, Ohio, on the Nickel Plate, involving 12 switches. The remaining installations of the year each involved from 1 to 4 switches at the ends of double track or junctions, the object of making the improvements in most cases being to eliminate interlockings at outlying points. In some cases the operating problem at these outlying switches was handled by the installation of a spring switch, a total of 57 such switches being put in during 1932, as compared with 122 in 1931. A spring switch lock operated automatically by the train itself was developed during 1932 and is operating satisfactorily on trial installations. The use of such a lock will no doubt extend the use of spring switches for locations where speed restrictions were otherwise considered necessary in connection with spring switches.

The construction of highway crossing signals continued during 1932 at approximately 25 per cent of the rate of the previous year, more than 883 signals and 44 gates being installed for the protection of 459 crossings, as compared with 2,368 signals and 34 gates for 1,136 crossings in 1931. During 1932 several states adopted the standards of the A. R. A. Joint Committee on Highway Crossing Protection, while many roads voluntarily adopted these standards. Of the 156 wig-wags installed in 1932, 12 were equipped with the A. R. A. standard button-type reflector sign reading Stop-on-Red Signal, and 2 were equipped with the automatically controlled illuminated STOP sign. Likewise, of the 662 flasher-light signals installed, 139 were equipped with the Stop-on-Red Signal sign and 137 with the STOP sign.

Table C—Remote and Centralized Control Installations Completed During 1932

Road	Location	Miles of Road	Manufacturer	Number of Levers: Desk Type	Number of Levers: Centralized Type	Power Operated Switches	Number of Signals Controlled
A. T. & S. F.	Raton, N. M., to Dillon, N. M.	....	Union	3	..	..	7
B. & M.	Waltham, Mass.	....	GRS	..	28	21	35
C. B. & Q.	Pacific Jct., Ia., to Plattsmouth, Neb.	5.0s	GRS	1	..	..	3
	Armour, Mo., to S. Iatan, Mo.	7.0s	Union	2	..	1	4
C. G. W.	Utica, Minn.	....	Union	..	..	..	2
C. M. St. P. & P.	Techny, Ill.	....	Union	..	6	4	10
	Bensenville, Ill.	....	Union	..	6	4	9
D. L. & W.	Elmira, N. Y.	....	Union	5	..	3	7
I. C.	Illinois Jct., Ill., to Ballard Jct., Ky.	....	Union	..	2	2	8
L. V.	Potters, N. J.	....	GRS	..	4	2	7
L. & H.	Franklin, N. J.	....	GRS	4	..	..	8
M. St. P. & S. S. M.	Schiller Park, Ill., to Junction 16	1.6s	GRS	1	..	1	3
M. P.	Harviell, Mo.	....	GRS	..	..	1	..
	Cliff Cave, Mo.	....	GRS	..	..	1	..
	Percival Jct., Tex.	....	GRS	2	..	..	8
	Similar installations located at various points	....	GRS	..	..	3	..
N. Y. C. & St. L.	Walbridge Park, Ohio, to Maumee	6.6d	Union	..	13	12	..
N. P.	West End, Mont., to Muir	1.0s	GRS	5	..	2	7
Reading	Neshaminy Falls, Pa.	1.0d	Union	2	..	3	3
S. P.	Alameda, Cal.	....	Union	5	..	..	6
T. & N. O.	Interlocker No. 76, Tex.	....	GRS	2	..	..	8
Wabash	E. Peru, Ind.	....	Union	..	2	1	4
	Totals	14.6s 7.6d					
		22.2		32	61	61	139

Table D—Automatic Interlockers Completed During 1932

Road	Location	Mfgr.	No. of Signals	Special Equipment
A. T. & S. F.	Princeville, Ill.	Union	7	..
	Hope, Kan.	RRS	4	..
	Jacobs (Ramona), Kan.	GRS	4	..
	Lathrop, Mo.	Union	4	..
	El Moro, Colo.	Union	5	..
	Sweetwater, Tex.	GRS	8	..
	Midlothian	GRS	10	..
Alton	Green Valley, Ill.	GRS	8	..
	White Hall, Ill.	GRS	8	..
B. & O.	Chicago Heights, Ill., 11th St.	.....	4	..
	17th St.	.....	4	..
	22nd St.	.....	6	..
	26th St.	.....	4	..
C. N.	Glencoe, Ont.	.....	8	..
C. P.	Regina, Sask.	Union	7	..
	Mayfair, Sask.	Union	8	..
C. B. & Q.	Ziegler Jct., Ill.	.....	9	..
	Lathrop, Mo.	.....	6	..
	Nickerson, Neb.	.....	8	..
	Northport, Neb.	.....	10	..
	Forman, Ill.	.....	10	..
C. M. St. P. & P.	Huson, Mont.	Union	4	1*
C. R. I. & P.	Peru, Ill.	.....	6	..
C. R. I. & G.	Shamrock, Tex.	.....	9	..
I. C.	Cedar Falls, Iowa	.....	6	..
M. P.	Benedict, Kan.	.....	6	..
	Toronto, Kan.	.....	5	..
N. P.	Eldridge, N. D.	GRS	3	1s
P. E.	Clearwater, Cal	Union	10	..
S. N.	Sankey, Cal.	Union	8	..
S. A. L.	Meggets, S. C.	Union	4	..
	Center Hill, Fla.	Union	8	..
	Iris, Fla.	Union	10	..
U. P. L. A. & S. L.	South Gate, Cal.	.....	8	..
	Ontario, Cal.	.....	7	..
	Total—35 plants		236	2

* = Movable point frog
s = Power-operated switch

Train Control and Cab Signal Activities

Activities in the automatic train control field during 1932 have been devoted primarily to the abandonment of such facilities rather than the construction of new installations. Eight roads using the intermittent system and one road using the continuous system have petitioned

Table Listing Roads Which Have Petitioned for Discontinuance of Train Control

Road	Track Miles	Locomotives Equipped	Date Granted	Remarks
G. N.	256	73	Jan. 11	
N. P.	216	52	July 11	
C. B. & Q.	244	86	Dec. 5	
U. P.	450	140	July 11	Cab signals continued
Penna.	1,392	1,108	Dec. 12	Cab signals continued
T. & N. O.	160	71		Hearing held
M. P.	53	43		Hearing held
C. R. I. & P†.	243			Hearing held
D. & H.	279	161		Hearing held
B. & M.*	203	157		
C. I. & L.*	161	50		
N. & W.	242	75		Cab signals to be continued
Totals	1,815	693		Installations to be abandoned
	2,084	1,395		Cab signaling only to be used

*Petition presented but hearing not yet held
†Request is to discontinue train control on second territory from Des Moines, Iowa to Davenport first territory Davenport to Chicago to remain in service.

the Interstate Commerce Commission for permission to discontinue the maintenance and operation of their train control, while the orders of the commission have been suspended in respect to three roads, the Great Northern, the Northern Pacific and the Burlington. Hearings or final action have not been completed as yet with reference to the remaining six roads. Three roads using the continuous system have requested permission to discontinue the use of automatic brake-applying apparatus but to continue the cab signaling, the commission amending its orders in this respect with reference to the Union Pacific, the Pennsylvania, and the Norfolk & Western.

The Bureau of Safety is continuing the periodical inspections of methods used by the carriers with respect to the maintenance and operation of train control systems. The method of tabulating performance records, in use for the past three years, has been simplified by the bureau so that considerable time and effort are saved in their preparation, with a consequent saving in the expense incident thereto.

The A. R. A. Committee on Automatic Train Control and the Bureau of Safety, in co-operation with various carriers and signal companies, are continuing the investigation of irregularities in operation and other conditions, and have developed new methods of testing that have greatly facilitated this work. Tests of interchangeability, conducted by the committee on the Boston & Maine, have demonstrated that the method proposed to effect interchangeable operation between General Railway Signal Company intermittent inductive equipment and Union Switch & Signal Company continuous stop or speed control devices are practicable for the purpose.

Although the record of the past year is not encouraging, it has not been without its constructive features. The installations of centralized traffic control, car retarders, remote control, and consolidated interlockings have demonstrated their operating economies, even under the present reduced traffic, at a time when these economies were very much in the minds of operating and executive officers. This record will not be forgotten as business returns to normal and will provide the basis for even more extensive installations of facilities of this character as means to economy and better service.

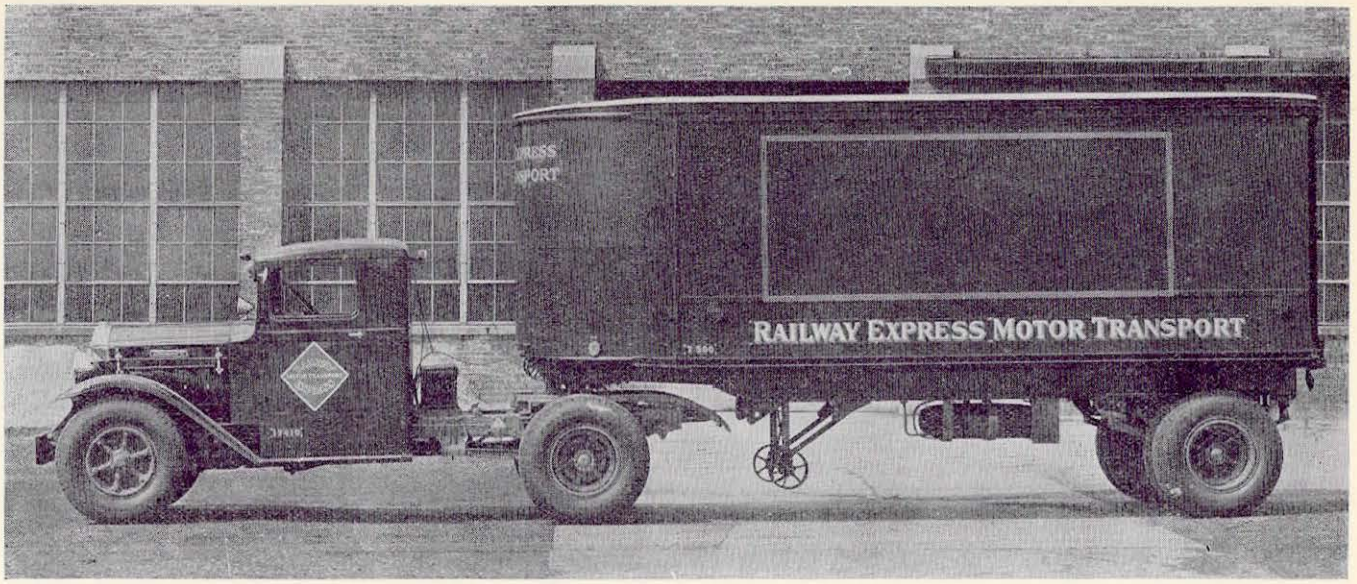
Table E—Highway Grade Crossing Protection Installed in 1932

Name of Road	Number of Crossings Protected	Number of Wig-Wag Signals	Number of Flashing-Light Signals	Number of Rotating Stop Sign Signals with Flashing Lights	Number of Traffic Type Stop and Go Signals	Number of Electrically Operated Gates
Alton	9	...	20	...	...	...
A. T. & S. F.	42	60	...	...	...	...
B. & O.	9	...	24	...	...	...
B. & L. E.	2	...	4*	...	...	...
B. & M.	1	...	1	...	...	...
	2	...	...	...	2	...
C. N.	1	...	...	...	...	4
	2	3	...	...	...	...
	1	...	2	...	...	...
	3	5	...	...	...	...
	3	...	6*	...	...	...
C. P.	5	6	...	...	...	4
C. R. R. of N. J.	7	...	27	...	...	...
	1	...	2*	...	...	...
C. V.	1	...	2†	...	...	...
C. & O.	8	...	20	...	...	...
C. & E. I.	5	...	11	...	...	...
	...	...	4†	...	...	...
C. & N. W.	3	5	...	...	...	...
	8	...	17	...	...	...
	1	...	...	...	...	1
C. B. & Q.	11	...	22	...	...	...
	13	1	24	...	...	...
	2	1	1	...	...	...
	4	...	8	...	...	...
C. G. W.	1	...	4	...	...	...
C. M. St. P. & P.	13	...	...	26	...	...
	2	3	...	...	...	...
C. N. S. & M.	9	...	2	...	...	7
C. St. P. M. & O.	1	1	...	...	...	...
C. & S.	3	...	6	...	...	...
D. L. & W.	4	...	8†	...	...	...
D. & R. G. W.	4	...	2	...	...	...
	...	...	2*	...	...	...
Erie	31	3	26*	...	...	...
	...	...	44†	...	...	...
G. N.	4	...	...	8	...	...
I. C.	1	...	2	...	...	...
	3	...	10†	...	...	...
	...	...	...	...	...	4
L. V.	2	...	5	...	...	...
	2	...	8†	...	...	...
L. & N.	1	...	...	...	...	2
	1	...	4	...	...	2
	1	...	...	...	...	2
	1	...	4	...	...	...
	2	...	4	...	...	...
	1	...	...	...	...	4
	1	...	...	...	...	4
	1	...	6	...	...	...
	1	...	6	...	...	...
	1	...	4	...	...	3
Me. C.	1	...	1	...	...	...
M. & St. L.	1	1	...	...	...	...
M. St. P. & S. Ste. M.	5	8	...	...	...	...
	7	...	14	...	...	...
	3	...	...	6	...	...
M-K-T	1	...	2*	...	...	...
	1	...	...	...	...	4
M. P.	9	...	18*	...	...	...
	1	...	2†	...	...	...
M-I.	2	...	4*	...	...	...
	2	...	4†	...	...	...
N. O. T. & M.	4	...	8*	...	...	...
I-G. N.	2	...	4*	...	...	...
N. C. & St. L.	12	...	24*	...	...	...
N. Y. C.	8	...	18	...	...	...
	2	...	4*	...	...	...
	1	...	2†	...	...	...
	2	...	2*	...	...	...
B. & A.	3	...	3†	...	10	...
M. C.	3	6	...	...	...	...
	2	...	4*	...	...	...
	6	...	12†	...	...	...
P. & E.	1	...	2	...	...	...
C. C. C. & St. L.	3	. .	6	...	...	...
	1	...	2	...	...	...
I. H. B.	1	...	2*	...	...	...
N. Y. C. & St. L.	6	...	6	...	...	...
	1	...	1†	...	...	...
N. Y., N. H. & H.	15	...	15†	...	1	...
N. Y. O. & W.	6	...	5	...	...	1
N. & W.	6	12†	...	...	...	...
P. E.	5	5	...	...	...	...
	1	...	...	...	...	...
Penn.	23	...	73	...	...	...
	2	...	7†	...	...	...
	3	...	11*	...	...	...
	1	...	...	...	...	2
	3	...	6*	...	...	...
	1	...	2†	...	...	...
L. I.	6	...	2	...	...	...
	...	...	4†	...	...	...
P. M.	10	3	3	...	...	...
	...	...	3†	...	...	...
Reading	7	...	17	...	...	...
St. L.-S. F.	1	...	2*	...	...	...
S. A. L.	6	...	13	...	...	...
S. P.	11	13	...	3	...	...
T. & P.	1	...	2*	...	...	...
	3	...	6†	...	...	...
T. H. & B.	1	2*	...	...	...	...
U. P.						
L. A. & S. L.	9	18	...	...	...	...
Wabash	2	...	6*	...	...	...
W. M.	7	...	7	...	...	...
W. P.	1	...	...	...	...	...
Totals	457	156	671	43	13	44
Totals Include		2*	139*			
		12†	137†			

* = New A. R. A. automatically controlled illuminated STOP sign used in conjunction with regular wig-wag or flashing-light signal.
† = New A. R. A. button-type reflector sign reading "Stop on Red Signal" used in conjunction with regular flashing-light signal and/or "Stop When Swinging" used with wig-wag signal.

Table F—Spring Switches Installed During 1932

Road	Number	Road	Number
A. T. & S. F.	15	D. & R. G. W.	3
A. C. L.	2	L. V.	3
B. & M.	1	L. & N.	5
C. of G.	1	M. P.	2
C. & O.	5	N. P.	1
C. B. & Q.	1	S. A. L.	2
C. M. St. P. & P.	12	S. P.	2
C. R. I. & P.	2	Total	57



Part of the Fleet of Tractor-Trailer Equipment with which the Railway Express Agency Is Experimenting with Highway Freight Operation

Railway Truck Use Greatly Extended

Train service further replaced and pick-up and delivery operations widened—Few changes in bus service

By John C. Emery
Motor Transport Editor, Railway Age

DETERMINATION to recover freight traffic which they had lost to highway competitors led many railways last year to continue and accelerate activities designed to bring about extensive co-ordination of freight train and motor truck service. The widespread adoption of one plan or another of providing for pick-up and delivery service by truck, in connection with road hauls by railway, was the outstanding development of 1932 with respect to the activities of the railways in the motor transport field. Physical co-ordination of railway and highway facilities, especially in connection with freight service, was substantially advanced during the year, generally to good effect.

Better freight service with which to recover lost traffic was the goal of all railways last year, and the improvements brought about through the speeding up of freight trains were accentuated by the general use of motor trucks to replace and short-cut train service at many points and also to extend fast railway service to the doors of shippers and consignees. Storedoor collection and delivery of freight as an accepted part of railway service has been sweeping gradually across the country for several years. The movement received its greatest impetus during 1932, with the result that at the present time the provision of such service by railways is the rule rather than the exception in all parts of the country except the central east and the far southeast, and in certain sections of the northwest. In New England, in the central south, in the middle west, in the southwest and in the Pacific Coast territory, this means of improving railway service and of opening the way toward the recovery of lost freight traffic has been generally adopted, and there have been isolated instances of the same sort even in those territories where the adoption of storedoor service has not been so general. Considering the extensive provision of pick-up and delivery service as it prevailed at the end of 1932, it appears that universal extension of railway service to the doors of shippers and consignees is not far in the future.

Railway Motor Coach Operations

Although the greater portion of the railways' motor transport activities in 1932 was devoted to the development of co-ordinated train and truck service, their motor coach operations were not neglected. There were few extensions of these, the tendency rather having been to put on as profitable a basis as possible the motor coach lines already in service. The peak in the motor coach operations of the steam railways which was established in 1931 has not been surpassed since that time, and indications are that further extensions of railway motor coach service will take place only after there has been a greater upturn in general business. Such additional motor coach routes as the railways established last year and as they probably will establish this year are of a train-replacement nature, with motor coach service substituted for train service to reduce the cost of providing necessary passenger transportation facilities.

Estimates indicate that at the end of 1932 the number of railways operating motor buses was approximately the same as it was at the end of 1931—namely, 80—and that the number of motor buses operated declined to approximately 4,800. The number of railways using motor trucks has increased to more than 100 and the number

of motor trucks operated, exclusive of vehicles owned by the Railway Express Agency, is in excess of 12,000. The actual number of motor trucks now being used by railways in connection with their freight service cannot be stated definitely for the reason that so many of them are operated for the railways by drayage companies under contracts, the number of trucks used varying even from day to day. The estimated increase of 2,000 in the number of motor trucks used by the railways during last year represents largely the extended adoption of pick-up and delivery service, and it is believed to be highly conservative.

Outstanding Developments in 1932

In the field of railway bus operation, perhaps the outstanding event of the year was the acquisition by the Great Northern of 70,000 shares of the common stock of the Pacific Greyhound Corporation, holding company for the Pacific Greyhound Lines which operate the largest system of motor coach routes in Oregon, California, Nevada, Arizona and New Mexico. Previously, the Southern Pacific, owning one-third of the capital stock of the Pacific Greyhound Corporation, had been the only railroad directly interested in this company. The Great Northern stock interest represents six and two-thirds per cent of the stock of the Pacific Greyhound Corporation.

During the year the Central of Vermont removed all passenger train service from its Burlington branch, connecting Burlington, Vt., with its main line, and began providing all passenger service to Burlington by means of buses for coach passengers and limousines for Pullman passengers. The Gulf, Mobile & Northern organized a subsidiary company, the Gulf, Mobile & Northern Transportation Company, which began the operation of

(*Continued on page 186*)

Orders for Highway Vehicles

Railroad	No.	Type of Vehicle	Model designation	Seating capacity or truck capacity in tons	Purchased by railroad or subsidiary	Where to be used	Manufacturer
Baltimore & Ohio	1	M. Coach	Parlor	.....	Subsidiary	Rev.	A. C. F. Motors
Boston & Maine	5	M. Coach	Model Y	29	Subsidiary	Rev.	General Motors
	1	.....	.....	.....	Subsidiary	Co. Business	Chevrolet
	1	Coupe	.....	.....	Railroad	Co. Business	Plymouth
	1	Coupe	.....	.....	Railroad	Co. Business	Pontiac
Central of New Jersey	2	Tractor	.....	.....	Subsidiary	Rev.	Mack
	1	Tractor	.....	.....	Subsidiary	Rev.	General Motors
	3	Semi-Trailer	.....	10 ton	Subsidiary	Rev.	Mack
	2	Semi-Trailer	.....	10 ton	Subsidiary	Rev.	General Motors
Chicago, Burlington & Quincy	1	M. Coach	.....	16	Railroad	Rev.	General Motors
	1	M. Coach	.....	12	Subsidiary	Rev.	Mack
Chicago, Milwaukee, St. Paul & Pacific	1	Truck	.....	1½ ton	Railroad	Co. Business	Chevrolet
	1	Truck	Model AA	8	Railroad	Rev.	Ford
	1	Sedan	.....	5	Railroad	Co. Business	Ford
	1	Sedan	.....	5	Railroad	Co. Business	Ford
Chicago, St. Paul, Minn. & Omaha	2	Truck	.....	2 ton	Subsidiary	Rev.	Reo
	1	Truck	.....	3 ton	Subsidiary	Rev.	Reo
Delaware, Lackawanna & Western	1	Truck	Model AA	1½ ton	Railroad	Co. Business	Ford
	1	Truck	Model AB	.....	Railroad	Co. Business	Ford
	1	Truck	.....	1½ ton	Railroad	Co. Business	Chevrolet
Denver & Rio Grande Western	2	M. Coach	.....	29	Subsidiary	Rev.	.....
	1	M. Coach	.....	16	Subsidiary	Rev.	.....
	1	M. Coach	.....	9	Subsidiary	Rev.	.....
	1	M. Coach	.....	10	Subsidiary	Rev.	.....
	1	Truck	.....	4 ton	Subsidiary	Rev.	.....
East Broad Top	1	M. Coach	Parlor	29	Subsidiary	Rev.	A. C. F. Motors
Florida East Coast	1	Coach-Truck	.....	.....	Railroad	Rev.	Chevrolet
Fonda, Johnstown & Gloversville	3	M. Coach	City	16	Railroad	Rev.	Mack
Greyhound Management Company	60	M. Coach	Obs.	33	.....	Rev.	General Motors
Huntingdon & Broadtop	1	M. Coach	Parlor	29	.....	Rev.	General Motors
	1	M. Coach	Parlor	17	.....	Rev.	General Motors
Kewaunee, Green Bay & Western	1	M. Coach	Parlor	29	Railroad	Rev.	General Motors
Lehigh Valley	1	Truck	.....	1½ ton	Railroad	Co. Business	Ford
Maine Central	5	M. Coach	Parlor	29	Subsidiary	Rev.	General Motors
	2	M. Coach	City	21	Subsidiary	Rev.	General Motors
	1	M. Coach	City	25	Subsidiary	Rev.	General Motors
Missouri Pacific	1	M. Coach	Parlor	21	Subsidiary	Rev.	.....
Monongahela	1	Truck	.....	3 ton	Railroad	Co. Business	Int. Harvester
Nevada Central	1	M. Coach	.....	8 Pass.-1 ton	Subsidiary	Rev.	General Motors
New York, New Haven & Hartford	5	M. Coach	City	31	Subsidiary	Rev.	Twin
	1	Truck	.....	2 ton	Railroad	Co. Business	Ford
	1	Sedan	.....	4	Railroad	Co. Business	Ford
	1	Coupe	.....	2	Subsidiary	Co. Business	Chevrolet
	2	Coupe	.....	2	Subsidiary	Co. Business	Essex
	5	Tractor	.....	2	.....	.....	Dodge
	6	Semi-Trailer	.....	7	Subsidiary	Rev.	Bodies by N. Y. N. H. & H. Chasses: Highway Trailer Co.
Pacific Electric	3	Truck	.....	1½ ton	Railroad	Co. Business	Chevrolet
Pacific Greyhound Lines	1	M. Coach	Parlor	33	.....	Rev.	General Motors
Pennsylvania	2	Truck	.....	5 ton	Railroad	Co. Business	.....
	1	Truck	.....	½ ton	Railroad	Co. Business	.....
	1	Truck	.....	1½ ton	Railroad	Co. Business	.....
	2	Sedan	.....	5	Railroad	Co. Business	.....
Pennsylvania Greyhound Lines	60	M. Coach	.....	33	.....	Rev.	General Motors
Pere Marquette	1	Truck	.....	.....	Railroad	Co. Business	Chevrolet
Railway Express Agency	249	Trucks	.....	Light duty	.....	Rev.	.....
	25	Tractors	.....	.....	.....	Rev.	.....
	4	Trailers	.....	.....	.....	Rev.	.....
Reading	3	M. Coach	Parlor	29	Subsidiary	Rev.	General Motors
	5	Tractor	BJ	.....	Subsidiary	Rev.	Mack
	2	Tractor	T-85A	.....	Subsidiary	Rev.	General Motors
	2	Truck	.....	1½	Subsidiary	Rev.	Ford
	2	Truck	.....	5	Subsidiary	Rev.	Fargo
	1	Truck	Model B	1½	Railroad	Co. Business	Ford
	6	Semi-Trailer	.....	10	Subsidiary	Rev.	Mack
	4	Semi-Trailer	.....	10	Subsidiary	Rev.	General Motors
Richmond, Fredericksburg & Potomac	1	Truck	.....	3 ton	Subsidiary	Rev.	General Motors
Richmond Greyhound Lines	3	M. Coach	Obs.	33	.....	Rev.	General Motors
St. Louis Southwestern	2	Truck	.....	4 ton	Subsidiary	Rev.	Dodge
Seaboard Air Line	1	Truck	.....	6 ton	Railroad	Rev.	General Motors
Virginia & Truckee	1	M. Coach	Pass. & Frt.	8	Subsidiary	Rev.	Ford
Waterloo, Cedar Falls & Northern	2	Truck	.....	1½ ton	Railroad	Rev.	Int. Harvester
	1	Truck	.....	1½ ton	Railroad	Co. Business	Int. Harvester

Communication Activities Curtailed

One of the Many Printing Telegraph Offices on the Pennsylvania

Figures for construction work completed in 1932 are much smaller than those for previous year

By S. R. Hamilton
Associate Editor,
Railway Age

CONSTRUCTION activity in the railway communication field was greatly curtailed in 1932. That the message traffic on most railroads during the past two years has been far below the capacity of the lines and equipment, is the general opinion of communication officers, and this fact is forcefully emphasized in the statistics, which cover the principal railroads of the United States and Canada. Reductions in the installation of plant facilities show marked declines from the previous low figures of 1931, the percentages of decrease ranging from 17 per cent in new or rebuilt pole line, to 80 per cent in new mileage of all types of telegraph circuits.

Although the number of new printing telegraph machines and the increase in the number of miles of printing telegraph circuits are about 50 per cent under the corresponding figures for 1931, there is considerable feeling that activity in this department will show a decided increase when traffic approaches its normal volume, especially where printers can be applied to heavy-traffic lines.

Table A—Principal Increases in Plant Facilities During 1932, Compared with 1931

		1932	1931
Miles of new or rebuilt pole line:			
Railroad owned	1,007		
Commercially owned	2,560		
Jointly owned	1,695		
Total		5,262	6,328
Mileage of new copper wire:			
Railroad owned	2,552		
Commercially owned	1,691		
Total		4,243	16,966
Increase in miles of road dispatched by telephone		389	1,192
Increase in miles of long-distance telephone circuits		2,286	7,395
New mileage of telegraph circuits, all types		2,658	13,602
Increase in miles of printing telegraph circuits		2,528	5,217
Number of new printing telegraph machines		31	59

In the past year 31 new printing telegraph machines were installed on five railroads, as compared with 59 machines on the same number of roads in 1931. Approximately 2,500 miles of circuit were converted to printer operation in 1932—a decrease of 51 per cent under the 5,200 miles of circuit so converted in 1931. Leading the list of participants in this phase of activity is the Pennsylvania, with 1,121 miles of circuit and 15 machines. This road in 1932 installed telephone-type automatic selectors for calling various printer stations from its Chicago office, with results said to be entirely satisfactory. The Texas & New Orleans completed 576 miles of printing telegraph circuit and put 12 more machines in service. Other roads reporting include the Missouri Pacific, 345 miles of circuit and 2 machines; the Seaboard Air Line, 351 miles of circuit and 1 machine; the Chicago, Milwaukee, St. Paul & Pacific, 1 machine; and the Chicago, Rock Island & Pacific, 135 miles of circuit.

Table B—Principal Copper Wire Installations Completed in 1932

Railroad	Miles of New Copper Wire: Railroad Owned	Commercially Owned	Total
T. & N. O.	295	407	702
D. & H.	144	286	430
N. & W.	372	...	372
M. P.	355	...	355
N. Y., O. & W.	335	...	335
B. & M.	43	287	330
F. W. & D. C.	33	223	256
Wabash	...	219	219
C. & O.	214	...	214

Telephone dispatching was substituted for other forms of dispatching on 389 miles of road, 174 miles of which is on the Frisco, 110 miles on the Fort Worth & Denver City, 102 miles on the Chesapeake & Ohio, and 3 miles on the Great Northern. A decrease of 208 miles of road dispatched by telephone was reported by the International-Great Northern. The gross increase in this category for 1932 is 67 per cent less than the corresponding figure for 1931.

Table C—Printing Telegraph Installations Completed in 1932

Railroad	Miles of Circuit	Number of Machines
Pennsylvania	1,121	15
T. & N. O.	576	12
M. P.	345	2
S. A. L.	351	1
C. M., St. P. & P.	....	1
C., R. I. & P.	135	..
Totals	2,528	31

Copper wire installations were reported by 30 roads. The Texas & New Orleans led the list with a total of 702 miles of new copper wire installed in 1932, of which 295 miles are railroad owned and 407 miles commercially owned. On the Delaware & Hudson the total is 430 miles; on the Norfolk & Western, 372 miles, and so on

down to only 1 mile on the N. Y. N. H. & H. The fact that the New Haven has been completely telephone dispatched since 1927 accounts to a considerable extent for its reduced requirements in this respect at the present time. The total amount of new copper wire reported is 4,243 miles, whereas in 1931 this figure was 16,966 miles.

Approximately 5,260 miles of pole line were built or rebuilt last year. This is only 1,070 miles, or 17 per cent, less than the amount for 1931. The Northern Pacific reported that at one place 38 miles of pole line were abandoned, part of which were replaced by 1.6 miles of underground cable. The Reading also installed some underground communication cables in connection with its electrification program. The sizes of these cables range from 27-pair to 78-pair and the length from 0.32 mile to 3.94 miles. On the Pennsylvania 108 miles of 54-pair 16-gage communication cable was installed.

In 1932 carrier-current transmission was applied to 757 miles of line on the Canadian Pacific and 546 miles on the Canadian National, but no work of this type was reported by roads in the United States.

Railway Truck Use Greatly Extended

(*Continued from page 184*)

several bus routes in G. M. & N. territory in Tennessee and Mississippi.

Railway Express Agency in Freight Field

In connection with truck operations, outstanding events were the adoption of storedoor collection and delivery service by the Boston & Maine and other New England roads, by the Louisville & Nashville and several of its connecting lines, the extension of this type of service in the Pacific Northwest and in the southwest, and the entrance of the Railway Express Agency into the field of motor truck transportation of freight. It had been expected for some time that the Railway Express Agency eventually would engage in the operation of motor trucks for the transportation of l.c.l. freight traffic. The company had already been engaged at a few points in the transportation of railroad freight by trucks from station to station.

Last year, the Express Agency organized Railway Express Motor Transport, Inc., purchased a fleet of tractors and semi-trailers, and began the provision of overnight truck service between Chicago and Milwaukee, Wis., and between Chicago and South Bend, Ind. The results of this operation, which is admittedly experimental in character, are being watched closely not only by officers of the Railway Express Agency, but also by those of the railways which own the express company. In addition to its middle western venture, the express agency is now operating motor trucks in Philadelphia, Pa., and Atlantic City, N. J., to pick up and deliver l.c.l. freight moving between those points via the Pennsylvania and the Reading, these roads having in effect tariffs providing for door-to-door transportation between shippers and consignees in Philadelphia and Atlantic City. The express agency is functioning in a similar manner in connection with certain freight services now offered by the Long Island, as is the case also at certain points in New England where the railways have extended their freight services to include pick-up and delivery.

One of the most interesting experiments in the coordination of railway and highway service was made during the year by the Chicago, North Shore & Milwaukee and by the Alton. First, the North Shore Line and then the Alton offered independent motor truck operators, carrying freight between Chicago and Milwaukee on the one hand and between Chicago and East St. Louis, Ill., on the other, the opportunity to ship their loaded motor trucks by rail on flat cars, instead of moving them over the highways in the usual fashion. Flat rates per truck or trailer were placed in effect, these being on a basis which made it cheaper for the truck operator to move his equipment by rail than to run it over the highway, and the volume of traffic which has been secured by these railways has been quite satisfactory.

The Regulatory Situation

Substantial progress was made during the year with regard to the regulation of the operations of intrastate motor carriers. In several instances drastic restrictions of the sizes and weights as well as the operations of intrastate motor trucks, provided for under new laws, were upheld by the Supreme Court of the United States. Like approval was also given to several unprecedented laws requiring the payment of special taxes by commercial motor vehicles. All interstate motor vehicle operations remained entirely unregulated throughout the year, with no expectation at the present time that this situation will be corrected until some future session of Congress convenes.

Early in the year the Interstate Commerce Commission issued its report in Docket 23400, Co-Ordination of Motor Transportation, representing the results of its extensive inquiry into the effect of motor competition on the railways and the extent to which railway and motor vehicle service has been co-ordinated. The report recommended the enactment of federal laws to provide for the regulation of motor vehicles engaged in interstate commerce as being desirable in the public interest. As yet, however, Congress has done nothing about it except to hold a few hearings.

Orders for Highway Vehicles

Railways, together with their subsidiaries and affiliated motor transport companies, ordered a total of 164 motor coaches, 281 motor trucks, 40 tractors, 25 trailers and 11 passenger automobiles during 1932 according to replies received by the *Railway Age* in response to questionnaires seeking such data. Comparable 1931 figures are: Motor coaches, 269; motor trucks, 841; tractors, 53; trailers, 62; passenger automobiles, 8. The Railway Express Agency was in 1932, as in previous years, the largest purchaser of motor trucks; orders placed last year by this joint subsidiary of the railroads involved purchases of 249 trucks, 25 tractors and four trailers. In 1931 the Express Agency ordered 783 trucks, 11 tractors and one trailer. The bulk of the 1932 motor coach orders reported were placed by various units of the Greyhound System which are affiliated with railways.

Statistics of motor vehicles ordered by railroads and their affiliates continue to be somewhat fragmentary. Vehicles ordered by contractors engaged exclusively in railway work are not reported by the railroads; also, many sales to the railroads are made by local dealers and are therefore not known to manufacturers who, in addition to the railways, receive questionnaires designed to collect the accompanying data. Replies to these questionnaires sent to manufacturers are checked with the railway replies and the resultant data are further checked with reports of orders placed throughout the year as published in the "Equipment and Supplies" columns of *Railway Age*. Thus it is believed that the most accurate figures obtainable are derived for the compilation which appears on page 184.

NEWS

Joint Rail-Highway Users Committee Issues Report

Deliberations result in agreement on some proposals for motor carrier regulation

Agreement in principle between its railway and highway members on some proposals for the regulation of motor carriers and on such other questions as motor vehicle fees for use of the roads, license reciprocity between states and the allocation of grade crossing elimination costs is revealed in the report of the Joint Committee of Railroads and Highway Users, which, however, records disagreement on the desirability of regulating truck freight rates and on length and weight limitations. The first two parts of the report were made public on January 30, and were filed with the National Transportation ("Coolidge") Committee. Part I contains the recommendations, while Part II is a series of notes explaining the reasons for differences where separate recommendations are made in Part I; Part III, to be made public later, will be "a summary of the historical factors with an objective discussion of the issues and their significance from the broad viewpoint of the public interest."

The report is the culmination of three months' study by the committee, the six railway members of which were appointed by the Association of Railway Executives. A like number of highway members receive their authority from the "Highway Users Conference" representing such interests as motor vehicle manufacturers, oil and gasoline companies, the National Grange, the National Association of Motor Bus Operators, the American Automobile Association and the National Chain Stores Association. W. W. Atterbury, president of the Pennsylvania, is chairman of the railway group while the highway members are headed by Alfred H. Swayne, vice-president of the General Motors Corporation. As special assistants to the committee's executive secretary—William J. Cunningham, James J. Hill Professor of Transportation, Graduate School of Business Administration, Harvard University—the report lists C. S. Duncan, economist, Association of Railway Executives, and Pyke Johnson, vice-president, National Automobile Chamber of Commerce.

In a joint statement accompanying copies of the report General Atterbury and Mr. Swayne expressed "hope and expectation that, as future conferences are held and facts are developed, even the present differences will disappear. To this end we are recommending to our sponsoring bodies that our committee be continued for further discussion." In commenting orally, as he distributed the report to the press, Mr. Swayne elaborated on the foregoing, saying, "We think that this is the beginning of an era of co-operation for we hope in the future to go before the public with a joint program which all can support;" and Paul Shoup, vice-chairman of the Southern Pacific, who represented General Atterbury, echoed, on the latter's behalf, Mr. Swayne's statement.

Speaking further for the highway members Mr. Swayne said that the interest of these was in co-ordination. "We like to say," he added, "that the most economical transportation would result if the railroads became general transport companies. This is an effort to accelerate that process."

The report opens with a declaration of policy to the effect that the public is entitled to the most economical and efficient means of transportation; that in principle all those using the highways for commercial purposes should be subjected to regulation; and that Section 500 of the Transportation Act should not be construed as an expression of favor by Congress for rail or water over motor transportation, nor as a declaration of the relative importance of the several kinds of transportation.

All common carriers of persons or property, it is agreed, should, if interstate operators, be under the jurisdiction of the Interstate Commerce Commission "or other properly constituted federal tribunal;" and, if intrastate, they should be subjected to the respective state regulatory authorities. Further, these common carriers should be required to obtain certificates of public convenience and necessity, in the granting of which the regulatory authority should

(*Continued on page 190*)

Fixed Maturities of Bonds "Against Nature"

It is in the nature of a railroad plant that it continually absorbs and "fixes" more capital and never returns any. That such a plant should be encumbered with an obligation to repay capital at a fixed date is an economic solecism of the first rank, for it is *contra naturam*. That, moreover, most of the debt outstanding on railroad property is of this sort and that only a comparatively small part of that debt is protected by sinking funds has assured realization of the fullest possible destructive effect of that fallacy.

—Thomas F. Woodlock in the Wall Street Journal.

Motor Trucking Presents New Marketing Problems

No satisfactory method of keeping track of the farm products moving on highways

Motor trucks are hauling an increasing volume of farm products, according to reports of field representatives of the Bureau of Agricultural Economics, U. S. Department of Agriculture. In the East, the situation is most observable in the many truck loads of Florida citrus fruits that are being retailed by truckmen-peddlers along the highways from North Carolina to Massachusetts, according to a Bureau press statement, and carlot receivers, wholesalers, and retailers of farm produce in practically all markets "are complaining of the truck competition." The bureau's market news representative at Chicago has reported that "truck receipts are becoming an important factor in the Chicago potato market, and local carlot receivers are inclined to view the situation with some alarm, as it is cutting in on their business." In one day, recently, 30 carloads of potatoes reached Chicago in motor trucks, principally from Michigan and Wisconsin.

"This stock," the bureau's representative continues, "is delivered to the jobbers' stores at about five cents per 100 lb., less than the local carlot price. Taking into consideration the five cents per 100 lb. drayage cost, it means that jobbers are able to buy trucked-in stock at about ten cents less than carlots on track. Carlot receivers can not meet this competition without a loss. Fully 75 per cent of the trucking is by growers and by small truckers with headquarters in producing areas."

"Unemployment," he concludes, "has no doubt contributed materially to the huge increase in truck movement, but the swing has been increasing rapidly each year, both as to tonnage and length of hauls. Unless some way is devised for obtaining at least a fairly complete record of truck movement of the various fruits and vegetables, the value of our rail and boat shipment figures will become impaired more and more each year."

The government marketing officials are interested in the latter phase of the situation. Prior to the advent of motor trucking, they had built up practically a 100 per cent accurate news service on the quantity of fresh fruits and vegetables moving daily from shipping points. This kept farmers, dealers, and wholesalers informed as to quantities received and to be received by rail and boat in consuming markets, and

(*Continued on page 190*)

Operating Statistics of Large Steam Railways—Selected Items for the Month of November, 1932.

Region, road, and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotives and tenders	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany.....1932	402	114,609	119,206	7,449	2,905	67.2	150,810	51,038	61	51	45.3	10
1931	402	132,794	137,589	9,049	3,516	64.9	183,317	61,001	75	58	43.4	21
Boston & Maine.....1932	2,062	247,485	277,443	24,271	7,889	65.9	434,348	156,432	134	153	53.4	28
1931	2,066	289,673	325,208	29,688	9,338	65.9	507,901	184,181	172	115	40.0	33
N. Y., New H. & Hartf. ..1932	2,043	317,954	381,899	19,004	9,520	64.6	516,889	188,446	213	139	39.5	11
1931	2,043	377,762	441,900	23,174	11,912	63.7	650,977	239,631	238	105	30.7	13
Great Lakes Region:												
Delaware & Hudson.....1932	848	196,102	257,304	25,627	5,961	59.4	382,891	171,634	255	26	9.3	158
1931	852	234,628	301,588	30,271	7,178	59.9	456,026	206,629	244	28	10.2	132
Del., Lack. & Western.....1932	998	313,995	345,005	43,274	9,914	65.6	567,807	220,080	203	66	24.4	62
1931	998	348,642	381,939	41,355	11,040	65.6	628,262	245,218	213	58	21.4	40
Erie (incl. Chi. & Erie)....1932	2,316	605,227	634,586	40,799	23,309	60.1	1,479,090	548,537	318	175	35.5	100
1931	2,316	652,647	680,592	51,023	27,252	59.7	1,695,972	618,481	375	120	24.2	115
Grand Trunk Western.....1932	1,023	169,807	171,288	1,590	3,868	59.3	237,361	81,233	92	64	41.3	27
1931	1,021	191,640	192,979	1,204	4,648	61.3	273,297	95,193	109	41	27.5	37
Lehigh Valley.....1932	1,343	336,621	352,770	32,359	9,906	63.4	604,004	242,942	188	130	40.9	25
1931	1,343	388,049	408,375	36,412	11,222	61.2	692,443	273,450	211	127	37.6	25
Michigan Central.....1932	2,039	335,023	335,159	8,912	9,240	59.0	559,002	187,222	119	82	40.9	28
1931	1,869	351,786	352,637	8,436	10,322	59.7	606,283	203,809	151	72	32.2	58
New York Central.....1932	6,181	1,366,323	1,457,091	102,259	46,313	58.2	2,980,466	1,193,620	575	652	53.1	35
1931	6,096	1,493,636	1,604,023	84,088	53,980	59.0	3,376,425	1,327,332	792	579	42.3	225
New York, Chi. & St. L. ..1932	1,661	416,334	428,193	4,621	11,803	61.1	689,310	236,223	127	115	47.5	31
1931	1,660	444,048	453,387	1,703	13,409	60.3	784,111	272,294	170	72	29.7	59
Pere Marquette.....1932	2,286	283,065	295,104	3,013	5,850	56.3	402,354	158,249	130	46	26.1	23
1931	2,241	293,053	300,241	2,983	7,138	59.9	446,876	170,975	147	31	17.4	36
Pitts. & Lake Erie.....1932	235	56,874	58,030	1,761	2,323	56.4	201,783	112,422	29	56	66.2	4
1931	235	69,045	70,271	903	2,662	55.7	225,074	123,366	55	25	31.5	30
Wabash 1932	2,497	466,825	475,909	9,981	13,395	62.8	766,212	248,634	185	179	49.2	29
1931	2,497	528,871	549,769	9,625	15,682	61.7	913,005	299,812	246	156	38.8	66
Central Eastern Region:												
Baltimore & Ohio.....1932	6,277	1,247,647	1,464,452	144,559	33,046	57.8	2,286,305	979,941	759	591	43.8	178
1931	6,285	1,396,796	1,605,204	167,581	39,381	57.0	2,730,861	1,164,998	948	424	30.9	292
Big Four Lines.....1932	2,790	589,944	605,360	16,737	15,624	58.7	1,070,167	489,256	270	179	39.9	11
1931	2,792	590,822	606,899	14,593	16,729	60.1	1,093,957	492,641	271	163	37.6	51
Central of New Jersey.....1932	692	131,933	143,244	23,018	3,999	55.6	282,772	129,759	114	64	35.8	57
1931	692	165,219	180,305	28,825	4,801	55.2	332,738	146,046	119	58	32.8	41
Chicago & Eastern Ill. 1932	939	172,657	173,165	2,975	3,266	59.5	225,590	98,661	74	91	55.2	30
1931	939	169,284	169,612	2,111	3,798	60.1	247,949	104,269	90	70	43.9	43
Elgin, Joliet & Eastern.....1932	447	60,225	61,121	1,253	1,282	55.2	106,817	51,237	78	12	13.6	37
1931	447	78,014	81,006	2,193	1,769	57.2	140,373	66,874	86	5	5.9	28
Long Island.....1932	396	32,353	33,363	13,706	313	50.4	24,179	8,830	35	13	28.1	8
1931	400	41,343	42,451	14,290	426	52.9	31,478	11,631	41	8	17.2	4
Pennsylvania System.....1932	10,528	2,433,952	2,721,821	261,505	76,995	58.9	5,273,249	2,242,972	1,883	632	25.1	799
1931	10,628	2,748,427	3,085,392	297,483	93,226	60.3	6,218,021	2,654,403	2,243	285	11.3	967
Reading 1932	1,454	364,792	398,804	38,970	9,565	57.1	707,427	330,982	282	109	27.9	109
1931	1,450	445,762	483,473	47,205	11,983	56.7	887,624	412,194	327	88	21.2	94
Pocahontas Region:												
Chesapeake & Ohio.....1932	3,136	792,905	832,261	27,556	31,943	53.1	2,826,018	1,518,196	517	158	23.4	203
1931	3,106	867,443	905,619	30,277	34,389	55.5	2,805,675	1,493,394	605	81	11.8	253
Norfolk & Western.....1932	2,224	549,054	570,887	27,756	20,088	56.9	1,692,533	880,162	418	61	12.7	170
1931	2,272	587,822	627,102	25,771	20,516	59.2	1,688,372	881,175	448	35	7.2	166
Southern Region:												
Atlantic Coast Line.....1932	5,144	482,785	483,279	6,910	9,036	61.1	484,946	161,372	375	96	20.4	141
1931	5,144	544,857	546,533	8,082	11,217	59.9	603,772	194,814	386	96	19.9	112
Central of Georgia.....1932	1,900	188,041	189,660	2,721	3,745	68.2	221,364	76,938	88	55	38.2	2
1931	1,900	204,258	205,152	2,943	4,594	67.4	246,335	90,463	104	44	30.1	3
Ill. Cent. (incl. Y. & M. V.) 1932	6,658	1,257,681	1,271,183	20,917	27,358	57.7	1,881,084	763,229	653	280	30.0	21
1931	6,670	1,340,724	1,353,059	23,434	31,192	56.8	2,155,982	823,482	757	165	17.9	57
Louisville & Nashville.....1932	5,177	875,865	937,384	25,554	17,899	56.9	1,285,277	601,696	368	342	48.1	96
1931	5,263	994,193	1,050,690	26,957	20,364	57.3	1,419,124	647,252	509	195	27.7	143
Seaboard Air Line.....1932	4,376	409,019	417,416	3,246	8,904	61.5	519,303	177,835	243	48	16.5	57
1931	4,466	468,044	474,688	4,828	11,078	60.6	655,344	222,497	251	37	12.9	51
Southern 1932	6,656	1,015,420	1,027,143	17,094	21,802	63.1	1,227,224	444,688	735	218	22.9	253
1931	6,675	1,131,862	1,146,345	18,774	26,000	63.0	1,454,246	540,241	781	183	18.9	225
Northwestern Region:												
Chi. & North Western.....1932	8,443	828,248	870,336	20,487	19,283	62.1	1,152,606	385,418	605	221	26.7	232
1931	8,459	989,194	1,022,375	24,879	23,443	61.2	1,390,069	504,030	669	136	16.9	209
Chicago Great Western.....1932	1,463	194,790	195,979	16,509	5,600	57.7	351,709	120,933	68	44	38.9	7
1931	1,459	225,893	226,099	13,554	7,178	58.0	443,018	159,195	74	42	36.2	4
Chi., Milw., St. P. & Pac...1932	11,234	1,069,035	1,128,332	48,295	25,598	61.5	1,599,472	641,561	746	164	18.1	360
1931	11,231	1,232,093	1,302,124	64,091	31,544	59.1	1,962,077	741,738	766	153	16.6	359
Chi., St. P., Minneap. & Om. 1932	1,714	202,161	207,364	8,532	3,662	64.4	220,522	85,681	144	26	15.4	77
1931	1,714	215,189	234,303	10,034	4,347	64.1	255,938	101,178	146	25	14.8	62
Great Northern.....1932	8,430	585,147	588,453	14,716	15,656	67.7	932,718	392,745	490	115	19.0	143
1931	8,311	609,644	616,509	20,656	19,327	66.8	1,137,705	477,093	484	146	23.2	125
Minneap., St. P. & S. St. M. 1932	4,325	337,320	340,398	794	6,204	65.9	347,099	142,979	145	53	26.9	13
1931	4,323	340,062	344,262	2,663	7,234	64.0	399,598	153,491	148	56	27.3	19
Northern Pacific.....1932	6,397	483,463	510,669	29,922	13,310	65.5	791,191	320,355	388	143	26.9	99
1931	6,402	564,815	595,568	37,811	16,402	67.0	952,404	391,563	396	125	24.0	68
Oreg.-Wash. R. R. & Nav..1932	2,185	135,023	139,159	7,206	2,999	67.3	171,039	65,161	83	43	34.3	25
1931	2,222	155,069	161,333	10,082	3,894	70.4	224,658	94,381	120	15	11.0	55
Central Western Region:												
Alton 1932	951	174,475	177,029	1,161	3,284	55.1	221,180	77,472	63	39	38.2	9
1931	1,000	193,910	200,248	1,123	4,034	56.2	264,807	95,070	84	26	23.7	19
Atch., Top. & S. Fe (incl. P. & S. F.) 1932	11,600	1,380,090	1,481,409	66,682	36,157	58.7	2,291,227	700,158	704	248	26.1	227
1931	11,623	1,494,448	1,604,434	70,932	43,097	60.6	2,681,050	895,092	745	204	21.5	231
Chi., Burl. & Quincy.....1932	9,198	1,030,470	1,058,479	31,819	24,127	58.3	1,468,136	620,601	478	145	23.2	44
1931	9,257	1,096,607	1,130,698	36,021	29,846	57.8	1,835,935	782,433	558	127	18.5	41
Chi., Rock I. & Pac. (incl. Chi., Rock I. & Gulf)....1932	8,333	951,209	960,736	3,254	19,356	57.8	1,205,498	424,367	479	141	22.8	133
1931	8,343	1,064,509	1,090,704	7,911	24,367	59.0	1,491,653	540,607	519	150	22.4	129
Denver & R. G. Wn. 1932	2,514	213,726	234,625	26,331	5,882	61.5	349,532	127,899	205	29	12.4	53
1931	2,557	260,538	286,843	31,315	7,208	62.6	427,180	169,184	216	24	10.0	39
Los Angeles & Salt Lake...1932	1,237	144,067	156,580	15,687	3,942	61.2	228,763	81,091	81	27	24.9	15
1931	1,241	171,513	185,256	18,620	4,798	63.0	272,437	96,596	101	13	11.4	33
Oregon Short Line.....1932	2,468	231,231	239,156	13,476	5,963	60.8	375,080	139,952	157	36	18.8	63
1931	2,515	254,899	264,628	17,401	7,419	63.6	458,414	183,095	171	6	3.3	63
Southern Pacific-Pacific Lines 1932	8,893	964,851	1,029,506	92,957	28,523	60.5	1,753,316	538,927	560	345	38.2	198
1931	8,937	1,054,640	1,126,828	107,607	31,230	61.5	1,925,963	632,253	654	289	30.7	230
Union Pacific.....1932	3,768	786,846	803,128	31,252	26,371	59.9	1,610,496	519,433	386	77	16.7	175
1931	3,768	847,343	867,749	35,166	31,375	61.9	1,876,800	637,747	418	38	8.4	174
Southwestern Region:												
Gulf, Colo. & S. Fe.....1932	1,943	193,450	198,210	4,000	5,284	61.2	329,578	130,406	102	24	18.7	34
1931	1,965	201,167	207,305	3,804	6,351	62.4	394,636	162,364	93	29	24.0	17
Mo.-Kans.-Texas Lines.....1932	3,282	338,535	340,159	4,299	8,388	58.0	516,480	183,660	153	72	31.8	70
1931	3,282	338,870	340,707	4,668	9,153	57.8	563,258	199,130	170	56	24.7	83
Missouri Pacific.....1932	7,409	1,074,842	1,105,753	25,870	25,232	60.0	1,613,255	621,426	466	124	21.0	165
1931	7,407	1,079,522	1,098,285	27,656	28,377	60.2	1,752,545	668,676	500	83	14.3	227
St. Louis-San Francisco....1932	5,193	614,246	616,670	5,420	11,849	59.3	748,828	292,869	407	72	15.0	135
1931	5,175	639,380	643,581	6,998	13,979	58.3	870,208	322,214	403	76	15.9	106
St. Louis Southwestern Lines 1932	1,902	183,036	184,556	2,582	4,069	59.0	247,586	82,519	111	24	17.7	36
1931	1,902	184,171	185,188	2,463	4,360	60.4	255,643	86,416	117	26	18.3	41
Texas & New Orleans.....1932	4,588	439,787	439,829	4,347	8,862	64.0	511,875	180,313	234	78	25.0	56
1931	4,649	488,847	490,529	1,553	10,450	59.2	645,704	229,836	233	97	29.5	40
Texas & Pacific.....1932	1,946	233,459	233,459	1,207	6,321	60.5	386,207	132,903	176	69	28.3	31
1931	1,946	286,230	286,230	2,025	7,005	57.2	456,170	153,774	186	60	24.5	41

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Compared with November, 1931, for Roads with Annual Operating Revenues Above $25,000,000

Region, road and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany 1932	4,624	2,840	7,464	35.7	21,181	1,316	445	17.6	228	19.3	4,235	166	37.7
1931	3,913	3,047	6,960	17.5	21,720	1,380	459	17.3	292	25.9	5,061	163	36.8
Boston & Maine 1932	11,034	6,829	17,863	20.3	23,496	1,734	623	19.8	288	22.0	2,493	112	35.1
1931	10,812	7,703	18,515	11.3	23,553	1,753	636	19.7	332	25.5	2,972	108	41.2
N. Y., New H. & Hartf. 1932	16,721	9,661	26,382	9.6	24,184	1,626	593	19.8	238	18.6	3,075	120	37.9
1931	16,221	12,552	28,773	4.5	24,234	1,723	634	20.1	278	21.6	3,909	112	45.2
Great Lakes Region:													
Delaware & Hudson 1932	11,756	2,148	13,904	4.1	26,033	1,953	875	28.8	411	24.1	6,746	123	33.6
1931	11,096	3,178	14,274	3.7	25,751	1,944	881	28.8	483	28.0	8,081	123	40.7
Del., Lack. & Western 1932	18,656	3,878	22,534	11.0	25,876	1,808	701	22.2	326	22.4	7,350	149	48.1
1931	18,744	4,764	23,508	7.2	25,285	1,802	703	22.2	348	23.9	8,189	146	52.0
Erie (incl. Chi. & Erie) 1932	36,117	11,115	47,232	5.7	37,755	2,444	906	23.5	387	27.4	7,895	109	45.7
1931	35,594	12,323	47,917	3.9	39,416	2,599	948	22.7	430	31.7	8,901	107	49.3
Grand Trunk Western 1932	5,491	7,575	13,066	14.8	23,303	1,398	478	21.0	207	16.6	2,647	118	37.0
1931	4,973	7,778	12,751	9.5	24,447	1,426	497	20.5	249	19.8	3,107	105	43.0
Lehigh Valley 1932	19,394	4,846	24,240	19.2	29,996	1,794	722	24.5	334	21.5	6,029	150	40.4
1931	22,270	6,218	28,488	10.2	29,331	1,784	705	24.4	320	21.5	6,788	143	43.9
Michigan Central 1932	24,105	16,562	40,667	10.1	29,081	1,669	559	20.3	153	12.8	3,061	137	57.1
1931	26,240	16,053	42,293	6.6	30,879	1,723	579	19.7	161	13.6	3,635	116	53.9
New York Central 1932	83,296	55,297	138,593	22.6	33,523	2,181	874	25.8	287	19.1	6,437	109	42.4
1931	79,104	64,390	143,494	14.5	33,898	2,261	889	24.6	308	21.2	7,258	104	41.1
New York, Chi. & St. L. 1932	15,658	6,179	21,837	14.4	28,896	1,656	567	20.0	361	29.5	4,742	109	59.7
1931	15,983	6,590	22,573	11.1	29,405	1,766	613	20.3	402	32.8	5,467	105	62.7
Pere Marquette 1932	14,117	4,616	18,733	2.8	23,502	1,421	559	27.1	282	18.5	2,307	104	56.3
1931	12,628	4,683	17,311	3.7	23,668	1,525	583	24.0	329	22.9	2,543	97	56.9
Pitts. & Lake Erie 1932	17,408	6,970	24,378	26.7	51,279	3,548	1,977	48.4	154	5.6	15,934	114	23.6
1931	19,787	6,439	26,226	15.3	41,435	3,260	1,787	46.3	157	6.1	17,506	98	29.6
Wabash 1932	19,531	7,405	26,936	9.4	32,837	1,641	533	18.6	308	26.4	3,320	120	44.5
1931	20,879	7,712	28,591	8.4	32,496	1,726	567	19.1	350	29.6	4,003	112	46.4
Central Eastern Region:													
Baltimore & Ohio 1932	97,202	16,818	114,020	13.5	24,145	1,832	785	29.7	286	16.7	5,204	156	39.7
1931	95,521	18,670	114,191	7.8	25,410	1,955	834	29.6	340	20.2	6,179	147	43.1
Big Four Lines 1932	22,136	18,776	40,912	17.5	31,202	1,814	829	31.3	399	21.7	5,845	120	46.2
1931	25,546	18,188	43,734	9.5	30,519	1,852	834	29.4	375	21.2	5,882	112	47.7
Central of New Jersey 1932	17,838	6,333	24,171	13.8	27,903	2,143	984	32.4	179	9.9	6,251	137	31.1
1931	17,240	6,843	24,083	12.5	26,130	2,014	884	30.4	202	12.0	7,033	143	39.3
Chicago & Eastern Ill. 1932	6,091	1,933	8,024	18.1	22,130	1,307	571	30.2	410	22.8	3,503	139	35.7
1931	6,050	2,240	8,290	14.1	27,033	1,465	616	27.5	419	25.4	3,702	128	35.8
Elgin, Joliet & Eastern 1932	9,802	3,783	13,585	12.7	15,596	1,774	851	40.0	126	5.7	3,820	136	23.1
1931	9,425	3,860	13,285	9.3	15,783	1,799	857	37.8	168	7.8	4,986	128	30.5
Long Island 1932	793	3,541	4,334	1.2	5,656	747	273	28.2	68	4.8	743	319	32.7
1931	782	4,939	5,721	1.0	6,527	761	281	27.3	68	4.7	969	349	38.4
Pennsylvania System 1932	248,419	47,034	295,453	8.7	30,576	2,167	922	29.1	253	14.7	7,102	135	39.5
1931	243,979	53,498	297,477	6.1	30,942	2,262	966	28.5	297	17.3	8,325	129	44.6
Reading 1932	39,172	7,537	46,709	14.4	22,620	1,939	907	34.6	236	12.0	7,590	156	37.3
1931	36,955	9,980	46,935	5.3	23,926	1,991	925	34.4	293	15.0	9,474	142	42.6
Pocahontas Region:													
Chesapeake & Ohio 1932	44,361	8,870	53,231	1.6	48,863	3,564	1,915	47.5	951	37.6	16,139	81	42.5
1931	46,907	8,167	55,074	2.0	43,405	3,234	1,722	43.4	904	37.5	16,027	81	45.5
Norfolk & Western 1932	38,248	4,165	42,413	3.6	44,671	3,083	1,603	43.8	692	27.7	13,192	114	41.6
1931	38,703	4,731	43,434	1.0	42,113	2,872	1,499	43.0	676	26.6	12,928	116	45.1
Southern Region:													
Atlantic Coast Line 1932	28,852	4,845	33,697	15.9	17,924	1,004	334	17.9	160	14.6	1,046	131	34.7
1931	28,386	5,893	34,279	6.3	18,637	1,108	358	17.4	189	18.2	1,262	119	38.3
Central of Georgia 1932	7,155	1,758	8,913	26.1	21,214	1,177	409	20.5	288	20.5	1,350	127	44.8
1931	7,938	2,014	9,952	18.4	20,120	1,206	443	19.7	303	22.8	1,587	134	46.9
Ill. Cent. (inc. Y. & M. V.) 1932	53,538	13,302	66,840	21.9	23,891	1,496	607	27.9	381	23.6	3,821	148	46.2
1931	52,782	14,061	66,843	13.3	25,331	1,608	614	26.4	411	27.4	4,115	139	49.7
Louisville & Nashville 1932	52,044	5,882	57,926	23.3	22,112	1,467	687	33.6	346	18.1	3,874	150	45.2
1931	51,431	6,750	58,181	16.1	21,736	1,427	651	31.8	371	20.4	4,099	150	51.0
Seaboard Air Line 1932	15,752	4,315	20,067	13.8	20,205	1,270	435	20.0	295	24.1	1,354	133	48.1
1931	15,084	4,882	19,966	4.0	21,051	1,400	475	20.1	371	30.5	1,661	128	55.6
Southern 1932	55,127	8,971	64,098	15.4	19,834	1,209	438	20.4	231	18.0	2,227	155	36.5
1931	56,760	10,742	67,502	14.0	20,332	1,285	477	20.8	267	20.4	2,698	154	40.3
Northwestern Region:													
Chi. & North Western 1932	46,101	19,933	66,034	8.8	21,231	1,392	465	20.0	195	15.7	1,522	135	35.9
1931	45,363	18,886	64,249	7.8	21,033	1,405	510	21.5	261	19.9	1,986	135	43.4
Chicago Great Western 1932	5,061	2,713	7,774	14.7	31,748	1,806	621	21.6	519	41.6	2,755	146	63.1
1931	4,885	3,904	8,789	8.4	32,432	1,961	705	22.2	604	46.9	3,637	133	69.0
Chi., Milw., St. P. & Pac. 1932	63,224	12,178	75,402	3.2	23,111	1,496	600	25.1	284	18.4	1,904	134	43.1
1931	63,735	13,007	76,742	2.3	24,128	1,592	602	23.5	322	23.2	2,202	124	49.6
Chi., St. P., Minneap. & Om. 1932	2,153	7,222	9,375	9.9	16,578	1,091	424	23.4	305	20.2	1,666	131	42.3
1931	2,242	8,184	10,426	10.4	17,812	1,189	470	23.3	323	21.7	1,968	126	47.6
Great Northern 1932	44,232	10,384	54,616	4.4	23,902	1,594	671	25.1	240	14.1	1,553	141	33.2
1931	44,442	11,061	55,503	6.5	26,388	1,866	783	24.7	287	17.4	1,914	137	33.7
Minneap., St. P. & S. St. M. 1932	20,680	2,584	23,264	3.9	16,281	1,029	424	23.0	205	13.5	1,102	125	57.4
1931	20,510	3,065	23,575	3.8	17,983	1,175	451	21.2	217	16.0	1,184	115	56.7
Northern Pacific 1932	43,311	4,054	47,365	9.5	24,102	1,637	663	24.1	225	14.3	1,669	158	33.9
1931	41,815	5,098	46,913	10.0	24,463	1,686	693	23.9	278	17.4	2,039	155	40.5
Oreg.-Wash. R. R. & Nav. 1932	9,280	1,751	11,031	6.8	20,961	1,267	483	21.7	197	13.5	994	152	38.7
1931	8,453	2,111	10,564	3.6	22,955	1,449	609	24.2	298	17.4	1,416	164	42.4
Central Western Region:													
Alton 1932	5,092	4,476	9,568	13.4	25,704	1,268	444	23.6	270	20.8	2,716	136	58.2
1931	10,769	3,371	14,140	23.7	25,969	1,366	490	23.6	224	16.9	3,170	126	61.0
Atch., Top. & S. Fe (incl. P. & S. F.) 1932	67,369	8,879	76,248	10.5	30,178	1,660	507	19.4	306	26.9	2,012	116	54.2
1931	66,093	10,753	76,846	10.5	31,301	1,794	599	20.8	388	30.9	2,567	108	58.9
Chi., Burl. & Quincy 1932	43,620	11,518	55,138	7.8	24,131	1,425	602	25.7	375	25.0	2,249	134	58.4
1931	45,938	12,977	58,915	7.2	25,627	1,674	714	26.2	443	29.2	2,818	127	56.8
Chi., Rock I. & Pac. (incl. Chi., Rock I. & Gulf) 1932	42,149	8,627	50,776	16.4	20,823	1,267	446	21.9	279	22.0	1,698	154	51.8
1931	40,766	11,216	51,982	11.2	22,332	1,401	508	22.2	347	26.5	2,160	139	54.8
Denver & R. G. Wn. 1932	13,371	4,122	17,493	3.5	23,108	1,635	598	21.7	244	18.2	1,696	174	37.2
1931	12,972	3,872	16,844	3.4	22,172	1,640	649	23.5	335	22.8	2,206	170	44.2
Los Angeles & Salt Lake 1932	4,794	989	5,783	7.2	27,140	1,588	563	20.6	467	37.1	2,185	144	53.4
1931	4,641	1,152	5,793	3.5	26,427	1,588	563	20.1	556	43.8	2,596	143	59.8
Oregon Short Line 1932	10,946	4,681	15,627	5.7	24,605	1,622	605	23.5	299	20.9	1,890	120	43.5
1931	9,671	6,172	15,843	6.2	27,547	1,798	718	24.7	385	24.5	2,427	115	53.1
Southern Pacific-Pacific Lines 1932	40,673	18,042	58,715	14.0	28,785	1,817	559	18.9	306	26.8	2,020	114	41.3
1931	43,246	20,294	63,540	13.2	27,143	1,826	599	20.2	332	26.6	2,358	119	43.6
Union Pacific 1932	24,910	9,131	34,041	18.5	38,331	2,047	660	19.7	509	43.1	4,595	118	60.0
1931	24,374	9,393	33,767	7.7	43,307	2,215	753	20.3	630	50.0	5,641	109	66.0
Southwestern Region:													
Gulf, Colo. & S. Fe 1932	12,224	2,339	14,563	7.2	27,656	1,704	674	24.7	298	19.8	2,237	111	53.5
1931	13,628	2,370	15,998	3.3	30,455	1,962	807	25.6	338	21.2	2,754	95	57.5
Mo.-Kans.-Texas Lines 1932	11,118	2,872	13,990	4.7	25,577	1,526	543	21.9	438	34.5	1,865	99	51.1
1931	12,244	3,955	16,199	4.5	26,745	1,662	588	21.8	410	32.6	2,023	93	51.0
Missouri Pacific 1932	27,647	15,369	43,016	14.1	25,922	1,501	578	24.6	482	32.6	2,796	145	63.9
1931	30,566	13,694	44,260	12.0	26,403	1,623	619	23.6	504	35.5	3,009	128	64.3
St. Louis-San Francisco 1932	26,687	4,356	31,043	7.3	20,598	1,219	477	24.7	314	21.5	1,880	149	43.3
1931	26,905	5,613	32,518	3.3	21,297	1,361	504	23.0	330	24.6	2,075	137	45.3
St. Louis Southwestern Lines 1932	4,324	1,866	6,190	13.2	22,677	1,353	451	20.3	444	37.1	1,446	118	46.3
1931	5,753	3,412	9,165	9.2	21,670	1,388	469	19.8	314	26.3	1,515	114	43.8
Texas & New Orleans 1932	9,062	10,478	19,540	6.2	18,186	1,164	410	20.3	308	23.6	1,310	105	47.5
1931	12,436	10,765	23,201	8.1	19,435	1,321	470	22.0	330	25.4	1,648	101	49.8
Texas & Pacific 1932	5,653	4,677	10,330	9.1	21,652	1,654	569	21.0	429	33.7	2,277	97	31.9
1931	5,825	5,394	11,219	10.5	22,221	1,594	537	22.0	457	36.4	2,622	94	39.1

Motor Trucking Presents New Marketing Problems

(*Continued from page 187*)

it was possible to divert shipments to prevent market gluts and famines. No satisfactory method has been developed to keep track of motor truck shipments rolling over a network of highways. Trading in important consuming markets is said to be at times demoralized by the unexpected receipt of motor-trucked produce. Carlot receivers at New York, Philadelphia, Boston, Chicago, and many other large markets complain of this situation.

A bureau representative at Grand Rapids, Michigan, recently reported: "Truck movement (of potatoes) is very heavy. Truckers, in addition to supplying the Detroit market, are now reported as supplying Chicago with liberal receipts. The continued and effective competition of truckers is creating a very serious problem for the rail shippers. Not only are the truck operators taking the tonnage away from the rail shippers, but they also operate on so small a margin that they can pay more and sell for less, so that the established potato firms are losing most of the margin of profit in the business they are handling."

At a recent Washington meeting of state and federal marketing officials it was declared that "motor truck transportation is the biggest marketing problem in all states," and the development of "some means of coordinating and regulating trucking facilities" was recommended. Reports indicate that the average quality and grade of motor truck commodities are lower than in the case of rail shipments. Carlot shippers contend that placing marketing control in the hands of numerous small truckers weakens the market price situation. Bureau records show that of the total fruit and vegetable receipts in eight large markets during the first 11 months of 1932, 36 per cent came by truck, compared with 29 per cent in 1931 and 25 per cent in 1930.

Joint Rail-Highway Committee Issues Report

(*Continued from page 187*)

give proper consideration to: Necessity for and the quality and permanence of the proposed service; existing transportation services—their adequacy and the effect of them of the proposed service; financial responsibility of the applicant, including adequate provision for surety or insurance.

It is next agreed the common carrier buses, both interstate and intrastate, should be subjected to rate regulation. This rate regulation, the railroad members would extend also to common carrier trucks but the highway group will agree to such extension only "if and when sufficient data have been collected to indicate the desirability of such regulation in the public interest." In Part II of the report the railway members point out that their recommendation in this connection is prompted by: The undesirability, from the shippers point of view, of secret rates, rebates and discrimination which cannot otherwise be eliminated; the belief that the present chaos delays co-ordination and that there is no other means of removing existing inequities from the transportation set-up.

Other recommendations in connection with the regulation common carriers are unanimous. They would prescribe accounting classifications, regulate security issues, prescribe qualifications and hours of service for drivers, and protect carriers in bona fide operation at the inception of any regulatory program.

It is agreed in connection with contract carriers in interstate service that these should be required to secure a permit, except certificated buses, which should not be required to secure a permit for occasional contract service. This same exemption for certificated buses is proposed in connection with the recommendation that intra-state contract carriers be required to secure a permit, in passing upon the application for which the state regulatory authority should consider the effect of the proposed operation upon highways and upon the safety and convenience of the traveling public. Each of the two groups included in Part II their interpretation of this recommendation. The railroad representatives hold that it has been correctly maintained in the Texas cases that a permit to operate is granted as a privilege; the highway representatives "accept the definition of permit set down by the Interstate Commerce Commission that when a motor carrier has complied with provisions for the protection of the public, as recommended by the Commission, he is entitled to a permit."

Unanimous recommendations in connection with contract carriers—interstate and intra-state—are that such operators should be required to meet requirements of public safety as to hours of service of drivers; to keep such records and file such reports as regulatory authorities require; and to make adequate provision for financial responsibility. It is also agreed that contract buses should be required to observe minimum rates, but as to rates of contract trucks the same disagreement as that over rate regulation for common carrier trucks is recorded.

Private passenger vehicles and private carriers of property, it is recommended, should not be required to secure a permit from federal authority and should be required by states to submit only to registration and police regulation requirements. To this recommendation, however, is added the proviso that "Any carrier of property who engages in the transportation on the highway of any commodity not of his own production, for hire or for the purpose of sale by such carrier as principal or agent, unless he has a bona fide established place or places of business regularly and continuously used for sale of such commodity, and any private carrier of persons who arranges as agent or principal to transport passengers on a share-expense or other irregular fare basis, should be required: To secure a license to operate...; to have financial responsibility...; and to meet requirements as to qualifications and hours of service for drivers."

Next come the recommendations that all highway carriers be required to observe regulations as to safety devices, sizes, weights and speeds of motor vehicles. Also, that necessary modifications of anti-trust laws be made to permit railroads to conduct highway operations on equal terms with all others and that railroads should not be required, in connection with grade crossing elimination projects, to make capital expenditures in excess of capitalized savings in operating expenses resulting from the elimination.

The total amount of motor vehicle fees, it is recommended, should be determined by the annual highway budget which should take into account (a) administration; (b) maintenance of existing highways; (c) interest charges on outstanding highway debt; (d) amortization or replacement; (e) improvements and new construction. Improvements or additions, the recommendation adds, should not be undertaken unless found justified after traffic surveys.

"Motor vehicles," this section continues, "should pay the entire cost of the state highway system. They should pay also a part of the cost of county and/or township highways, that part to be determined by the extent to which such county and/or township highways are in general rather than local use. Furthermore, motor vehicles should contribute in part to the cost of arterial routes through cities. The classification of highways between those of general use and those of local use...should be made by the authorities in each state in the light of its local conditions."

The apportionment of special taxes among motor vehicles of various types should be based upon use of facilities required, and should be sufficient to pay their fair share of total annual costs. Separate schedules should be determined for passenger automobiles, buses, and trucks.

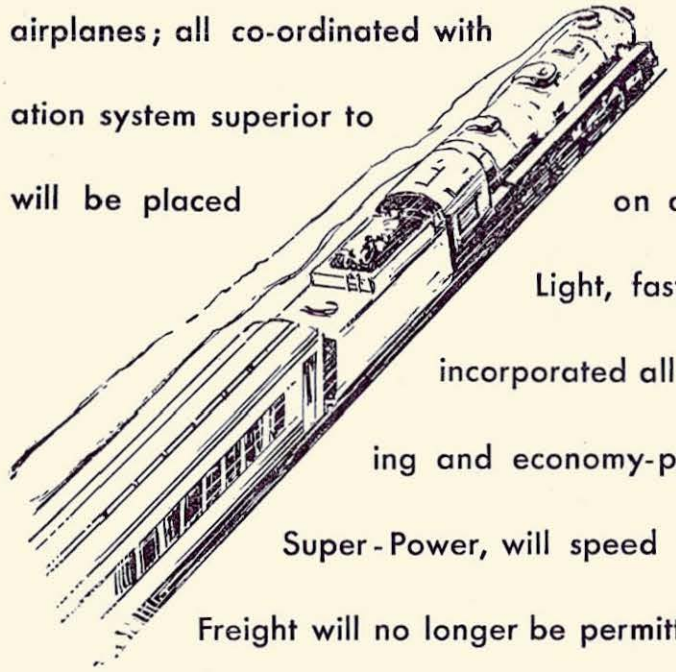
The basic cost of constructing, improving and maintaining a given highway should be determined from a highway designed for private passenger vehicles and other vehicles commensurate therewith. All vehicles using such highways should pay their proportionate share of that total as a base tax. The total additional cost of construction, improvements and maintenance to make a road suitable for a type of vehicle requiring such additional cost should be shared by each vehicle of that type and each vehicle of greater size. Thus, each group should share in the base cost plus all increments of cost up to and including cost required by it.

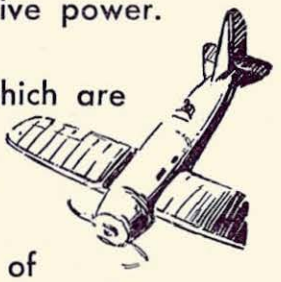
Final recommendations relate to reciprocity and physical regulation. In connection with the former it is suggested that states enter reciprocal agreements for issuance of special licenses at equitable rates. In connection with physical regulation agreement is reached on a width limit of eight ft. and a height limit of 12½ ft. On lengths and weights there is disagreement, with the railroad members holding that these matters should be left to the individual states and the highway representatives favoring the uniform code promulgated by the American Association of State Highway Officials and the U. S. Bureau of Public Roads (see *Railway Age*, January 7, page 3). Because of the recommendation that motor vehicles contribute in part to the cost of arterial routes through cities it is recommended that municipalities should not impose, on such arterial routes, restrictions beyond those imposed by state laws. In a dissent to the foregoing Robert P. Hooper, representing the American Automobile Association, goes further and suggests that under no circumstances should municipalities have the right to go beyond the restrictions contained in the state laws. Another dissent is recorded on behalf of the International Association of Milk Dealers which does not agree to maximum lengths and weights as low as those agreed to by the majority of the highway representatives.

Continued on next left-hand page

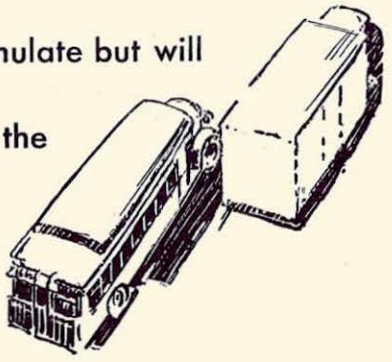
THE RAILROADS OF THE FUTURE

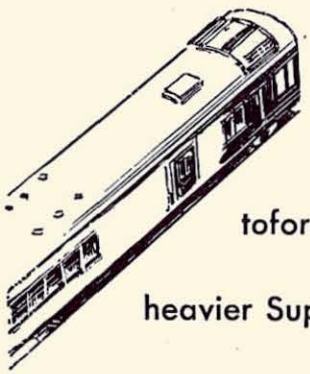
The railroads of the future will sell "transportation." Incorporated in this transportation system will be trucks, buses, rail cars and airplanes; all co-ordinated with the railroads to produce a transportation system superior to any we have known. ¶ Emphasis will be placed on a new type of motive power.





Light, fast locomotives, in which are incorporated all the power-increasing and economy-producing principles of Super-Power, will speed freight movement between stations. Freight will no longer be permitted to accumulate but will be kept in motion. Whereas heavy haulage now has the benefit of modern heavy Super-Power, the light traffic has heretofore been handled by obsolete locomotives released by the heavier Super-Power. These must be replaced by new power designed specifically for the light, fast service that will win back lost traffic.





LIMA LOCOMOTIVE WORKS, INCORPORATED

LIMA OHIO

LIMA LOCOMOTIVE WORKS INCORPORATED

Unified Regulatory Plan Considered by Roosevelt

President-elect studying program for centralized supervision of all forms of transport

Plans for legislation to combine regulation of all forms of interstate transportation under a single federal bureau or commission, probably a reconstituted Interstate Commerce Commission with enlarged powers to deal with the various carriers now competing with railroads, are under consideration by President-elect Roosevelt as part of his program for the coming extra session of Congress, according to reports emanating from his press conferences at Warm Springs, Ga. This plan would bring under one regulatory body such degree of federal regulation as may be decided upon for inland and coastwise water transportation, highway motor-vehicle transportation, airplanes, and pipe lines. Some of the proposals heretofore made have contemplated regulation of water transportation by the Shipping Board and of motor transportation by the Bureau of Public Roads. A bill is now pending in Congress to provide for a degree of regulation of intercoastal transportation by the Shipping Board but proposals for federal regulation of highway transportation have been postponed until the next session of Congress. The President-elect has been in consultation on various phases of the transportation situation, personally and through associates, with several railroad executives; and Walker D. Hines, former director general of railroads, was among his visitors last week at Warm Springs. In his speech at Salt Lake City during the campaign Governor Roosevelt proposed a national policy for dealing with all forms of transportation, to include regulation by the Interstate Commerce Commission of competing motor carriers, and plans have been made by Democratic leaders in Congress for a rather extensive program of transportation legislation at the extra session.

Commissioner Joseph B. Eastman, who has been in conference with Mr. Roosevelt on the subject, gave, before the House committee on interstate and foreign commerce on January 18, (speaking on the bill to authorize the commission to delegate certain of its functions to individual commissioners or boards of employees), an outline as to how the commission might expand its organization and handle the work if it were given power to exercise comprehensive regulation over all agencies of interstate transportation for hire. As illustrative of the possibilities, he said, this might involve the creation of a new Bureau of Motor Transportation to deal with matters in connection with the regulation of motor vehicles (except accounting and tariffs, which could be handled by the present Bureau of Accounts and Section of Tariffs), also the creation of a new Bureau of Water Transportation, functioning along similar lines, and the creation in the Bureau of Finance of a section for work on railroad reorganizations, recruited from the present force but augmented by some new men with the appropriate legal and financial experience.

In his testimony before the House appropriations committee on the commission's appropriation bill for 1934, before he went to New York to confer with Governor Roosevelt, Mr. Eastman said the commission was faced with a possibility, if not a probability, that it may be called upon to regulate the operations of motor buses and motor trucks, and perhaps water lines, and that there is also a possibility that it will have greatly enlarged duties in connection with financial reorganizations of railroads.

Commissioner Eastman and Commissioner Mahaffie conferred on the railroad situation with Governor Roosevelt in New York on January 11.

House Committee Approves Short Week Bill

A favorable report on the Connery bill to prohibit the interstate transportation of articles produced in establishments where employment is not restricted to five days a week and six hours a day was submitted to the House on January 31 by the House labor committee.

I. C. Shuttle Service for Fair

The Illinois Central is planning to operate shuttle trains during the 1933 Century of Progress Exposition at Chicago between the Fair grounds proper and Sixty-Seventh street, to provide service to the Museum of Science and Industry, the Rosenwald museum in Jackson Park. The proposals now under consideration provide for utilizing existing South Side stops, including the Fifty-Seventh Street station, which is within short walking distance of the Museum.

Must File Stock Issuance Certificates in Illinois

According to an opinion given by Attorney General Otto Kerner, of Illinois, the Transportation act of 1930 makes it necessary for railroad companies to file certificates of issuance of stock in the office of the secretary of state of Illinois. The opinion was given as the result of contention by counsel for the Illinois Central that under the Transportation act, the company is not required to file such a certificate.

Lower Pullman Fares Approved Within Illinois

The Pullman Company, operating in conjunction with Illinois railroads, was authorized by the Illinois Commerce Commission, on January 24, to put reduced Pullman rates in effect with week-end excursions. The order is effective from January 28 to April 30 and establishes a round-trip excursion rate of one and one-half times the regular one-way Pullman fare. The ruling applies only to long excursion trips and is the first time any reduction in Pullman fares has been directed or authorized in Illinois. In the past excursion tickets did not carry Pullman privileges unless the full Pullman fare was paid.

Couzens Asks Suspension of R. F. C. Railway Loans

Resolution provides that further aid should await new action by Congress

A Senate joint resolution that no loan to a railroad or receiver of a railroad shall be made or approved by the Reconstruction Finance Corporation until Congress shall otherwise provide was introduced in the Senate on January 27 by Senator Couzens, chairman of the committee on interstate commerce, who said he desired to suspend further loans until action has been taken on the bill to provide for voluntary railroad reorganizations under the supervision of the Interstate Commerce Commission. "Perhaps if that bill is enacted," he said, "it will act as a buffer until the situation can be straightened out. In the meantime, I am unwilling, unless the Congress authorizes it, to have the Reconstruction Finance Corporation continue making these loans on the credit, at least, if not the ultimate payment, of the taxpayers of the United States. I do not propose that we should not continue making the loans at some other time. It may be upon investigation and further study that we would reinstate the authority." The resolution was referred to the committee on banking and currency.

Senator Couzens also expressed the opinion that there will be no necessity for further applications for loans from the R. F. C. if Congress passes an adequate reorganization bill; though railroad men have taken the position that further loans will be necessary in any event because of the time that would be required for reorganizations. He said "the government has gone about as far as it can to maintain the debt structure of these institutions which we took care of in February, 1932" and that "it is apparent that we cannot, with the taxpayers' credit, maintain the capital structure of many of the railroads that are in difficulties; and unless some form of legislation is set up for reorganization of the capital structure of many of these railroads, or unless they set up some voluntary system of reorganization and capitalization, they will have to go through receivership." He said he had information that if the reorganization bill is passed many of the railroads would avail themselves of the "privileges" granted under it. He criticized bankers for urging the government to make loans to railroads which, he said, they were unwilling to make themselves.

The committee referred the resolution to a sub-committee headed by Senator Couzens, which began an investigation of the railroad loan situation at a hearing on Tuesday. The R.F.C. was called upon for a list of the loans already authorized, amounting to $337,000,000 at the end of the year, with a statement of the purposes and estimates of the value of the collateral at the time the loans were made and at present. Senator Couzens also proposed to ask for the names of roads likely to borrow in the next six months. Atlee Pomerene, chairman of the R.F.C., the first

witness, said his thought was that one of the weak points in the depression was the very serious situation of the railroads and that while the railroads are the direct recipients of the loans the reason for them goes much farther. If receiverships can be avoided it will be for the benefit of the entire industrial, financial and commercial worlds. He said his position, and he thought it reflected the views of all members of the board, was that if there is no other possible way of financing the railroads and avoiding receiverships the loans ought to be continued; but that he had a feeling that some of the larger banks ought to play a larger part in financing the roads, and renew loans as they mature instead of treating their funds as if in "cold storage." Mr. Pomerene and other officials of the board were questioned in detail regarding various features of the loans and Senator Couzens particularly criticized the loans made to pay bank loans, saying he thought the R.F.C. had "fallen down badly" in making them without information as to the financial condition of the banks.

Mr. Pomerene pointed out that the loans made to pay bank loans, $37,793,900, represent only 11 per cent of the total and that failure to make them might have had unfortunate results; also that the banks had been required in most cases to carry half of the loans. Myles Kennedy, chief examiner of the railroad division of the corporation, explained that most of the large bank loans were made purely as emergency loans to the railroads for short terms to meet pressing obligations of the railroads before the finance corporation got organized and that the difficulty today is that banks ordinarily do not and commercial banks should not make long-term loans.

Senator Couzens referred to a statement of railroad earnings for eight months of 1932, showing a large number that had operating deficits before consideration of fixed charges, and asked if the government should make loans to such roads. Mr. Pomerene said that no loans had been made except on what appeared to be adequate security and that none had been made to such roads as some of those cited by Senator Couzens as examples. Mr. Kennedy also pointed out that the railroad earnings situation had improved somewhat in later months. Mr. Pomerene said he thought it would be a mistake to cut off the loans entirely but that it would also be a mistake to make loans on expediency alone without adequate security.

Commissioner Joseph B. Eastman was then called as a witness and asked to return on the following day with comments as to the future prospects of the list of about 125 Class I roads that lost money in eight months of 1932 and what the policy ought to be as to any further loans in the light of such prospects. Senator Couzens also asked for any available data as to the relation between the present valuation of the railroad property and the commission's valuation figures and the railroad securities outstanding.

Commissioner Eastman on Wednesday emphatically advised against suspending all railroad loans unless Congress distrusts the judgment of those who administer them. Such loans are justified, in his opinion, he said, "if funds cannot be obtained on reasonable terms from private sources, if it appears that the security offered will be adequate and if it further appears that the results will promote the public interest." Before he had concluded Senator Couzens seemed convinced himself, because he asked if it might not be possible for Congress to specify more closely the purposes for which loans might be made, to avoid giving "preference to certain classes of creditors." Commissioner Eastman replied that he would not know how to draft such a statute because the needs of the roads differ as to the purpose for which the money is required. He said the loans already made had served in part to "prevent an epidemic of receiverships, which might have caused a further shock to financial conditions," and had served the public interest in other ways, and that there are individual railroads or groups of railroads to which further loans can safely be made. There are certain railroads which can probably be carried on by means of such loans for some considerable time without need for financial reorganizations, he said, and there are others which will probably need early financial reorganization, but which might through government loans be saved from receivership long enough to take advantage of the new legislation proposed providing for another method of reorganization.

Some roads which seem doomed to reorganization might be saved from receivership, Commissioner Eastman said, pending the enactment of the reorganization legislation, if the government were empowered to make loans for purposes for which receivers' certificates may be issued, and he pointed out that when once loans are made further loans may be desirable to protect them. Replying to the question as to valuation, he said that since 1930 the commission's figures show that there has been a drop in the cost of reproduction of about 15 per cent, which would bring the total cost of reproduction new at spot prices down very close to original cost, which had been estimated at $22,689,319,063 as of 1930, although he could give no estimate as to the reduction in land values. The present value of lands was estimated at $3,778,248,076 as of 1930. He said he was not so pessimistic as to the future of the railroads as some and could see some hope for them because, among other reasons, it ought to be borne in mind that the production of a truck per man-hour is nowhere near the production of a railroad per man-hour, that in all probability many of the trucks are operated at a loss, and that there is a demand for regulation of them.

Commissioner Eastman submitted a statement indicating that 60 Class I roads had a deficit in net railway operating income in 1932, of which 25 were subsidiaries of stronger roads, 9 are controlled by foreign systems, 7 may be classified as short lines, 6 are controlled by steel companies, and 1 by a copper company. The others are the Chicago & Eastern Illinois, the Chicago, Milwaukee, St. Paul & Pacific, and the Gulf, Mobile & Northern.

Commissioner Eastman was followed by Daniel Willard, president of the Baltimore & Ohio, who endorsed what Mr. Eastman had said and expressed the opinion that to stop all railroad loans now would be "disastrous," especially as the Couzens resolution would suspend loans already authorized but only partially advanced so far.

Mr. Willard, expressing a hope that the resolution would not be passed, said that the Baltimore & Ohio has been one of the heaviest borrowers from the R. F. C., which has authorized $67,125,000 in loans to it, including half of the amount of its $63,000,000 of bonds maturing March 1 which it has now arranged to refinance at that time under a plan which has been accepted by 90 per cent of the bondholders. He pointed out that those bonds were issued 20 years ago to finance increased facilities which were urgently demanded by the shippers in the B. & O. territory, and that the company by 1929 had thought it had made ample arrangements for taking care of them. He pointed out that the railroads occupy a situation somewhat different from that of others because their large capital expenditures in recent years were made in direct response to emphatic demands from the highest sources on the theory that unless the railroads increased their facilities "we were bound to have government ownership." He said that the Baltimore & Ohio had laid off more than half its employees in three years and might be compelled to make further reductions this year in order to earn its fixed charges but that he did not expect to have to call on the R. F. C. for any more loans. He doubted if the railroads would ever feel the weight of truck competition any more than they now are and said: "I am not at all worried about the future of the railroads unless this is going to be a 50 per cent country from now on and I cannot believe that." The hearing was adjourned subject to call by the chairman.

Club Meetings

The Car Foremen's Association of Chicago will hold its next meeting on Monday evening, February 13, at the Auditorium Hotel. The discussion will be on the A. R. A. Rules of Interchange.

The Central Railway Club of Buffalo, (N. Y.) will hold its next meeting at Hotel Statler, Buffalo, Thursday evening, February 9. William M. Sheehan, of the General Steel Castings Corporation, will present a paper on "The Railroads, Steel Castings and Prosperity," illustrated by the stereopticon.

Rock Island's World Fair Exhibit

Eighty-one years' development of the Chicago, Rock Island & Pacific and its territory, condensed into a presentation of only a few minutes' duration, continuously repeated, will constitute the theme of the exhibit of that railroad in the Travel and Transport building of the Century of Progress, which opens in Chicago on June 1. The story will be told by several devices, among which is a 17-ft. "Map that Talks," showing 14 middle western states, and depicting the industrial and agricultural products of the territory with notes of the service rendered by the railroad. The space will also embody a sound-motion picture, in natural colors, of the Golden State Limited and the Rocky Mountain Limited routes. The

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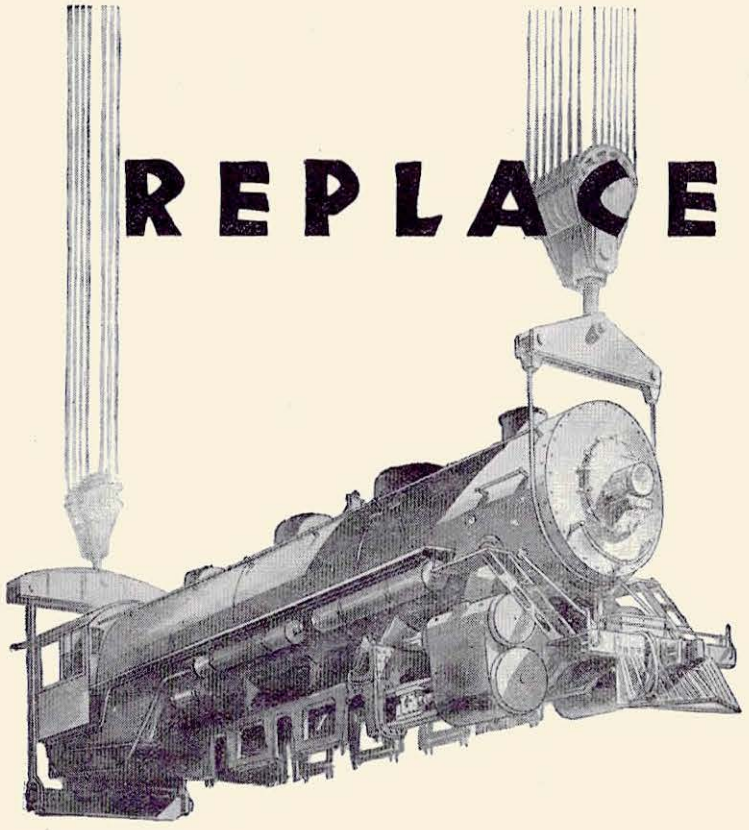


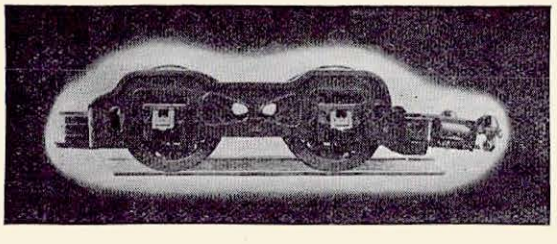
REPLACE "HIGH LOCOMO

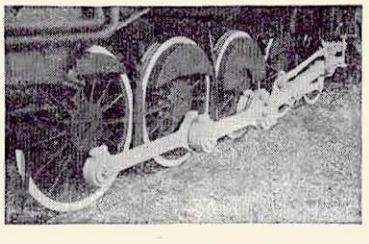
power equip

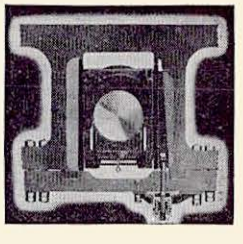
As locomotives get along in years they become more and more expensive to maintain until finally their excessive cost warrants the purchase of new power.

This is true today of thousands of locomotives. If you disregard the greater operating economy of the new power and consider only the saving in maintenance, you are more than justified in buying new locomotives.

But don't just buy new locomotives. Provide a new design in which is built the many Franklin devices that will aid you in keeping maintenance at the minimum. There was never greater demand for this kind of action, nor a time when you needed more help.







FRANKLIN RAILWAY

NEW YORK

MAINTENANCE" TIVES . . with modern ped to keep repairs low

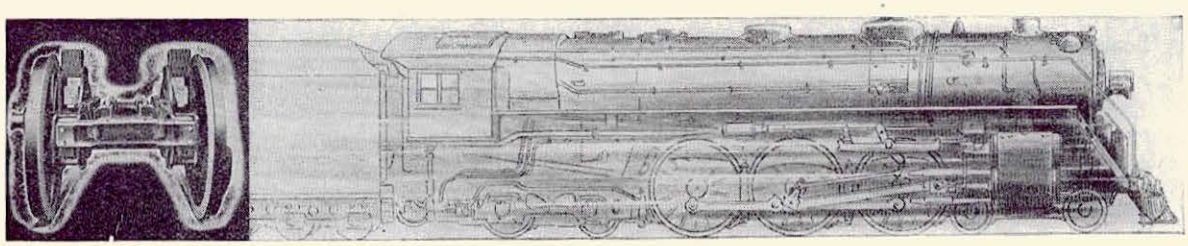
By making it possible to use a locomotive of fewer drivers to do a given job, The Locomotive Booster reduces maintenance costs five to ten cents per locomotive mile since maintenance is roughly proportional to the number of drivers, as your own records show.

The Tandem Main Rod Drive distributes the piston thrust through two axles and four outside main crank pins. The work of the main pin is thus reduced 25 to 50 per cent. By providing two pairs of "mains" instead of one, a better power distribution is secured and the wear on driving brasses and main and side rod bushings is reduced. Improved power distribution also reduces the stresses on machinery and reduces slipping, thus controlling one of the causes for high maintenance.

Shoes and Wedges are another maintenance item on which Franklin helps.

The Automatic Adjustable Driving Box Wedge prevents brass-pounds from accumulating and thereby protects the whole locomotive foundation from the racking pounds that come from loose wedges.

Flange wear is another reducible maintenance factor. The Lateral Motion Driving Box eases the locomotive around curves thus reducing flange grinding and flange wear, especially on switchers as it permits an eight wheeler to go where only a six could go before.



SUPPLY COMPANY, INC.

CHICAGO MONTREAL

animated map will be accentuated by a monumental mural reflecting the influence of the railroad on the progress of the territory it serves. This map will bring out the growth of the Rock Island Lines by decades, and the resultant progress of the states as the railroad expanded its service.

Supplementing the general theme will be a motion picture at each end of the 100-ft. exhibit space, illustrating some of the interesting activities of the railroad with which the general public does not come in direct contact, but which form an important part of the railway service.

Giving Away a Railroad

Victor Miller, receiver for the Rio Grande Southern, and W. C. Johnstone, a Denver business man, have announced to the Public Utilities Commission of Colorado that they are willing to accept the Denver-Leadville branch of the Colorado & Southern as a gift. Johnstone contends that the railroad will pay if the receipts and expenses of that branch are figured alone and not incorporated within the general funds; and that the country traversed is rich in minerals, coal, lumber and grazing, and can support the line.

Changes in Illinois Commerce Commission

Governor Horner of Illinois has appointed three new members to the Illinois Commerce Commission, and these appointments have been confirmed by the state senate. B. F. Lindheimer, president of the Chicago board of local improvements, succeeds J. Paul Kuhn, Batavia, and has been appointed chairman. The other new members are Andrew Olson, Moline, who succeeds Rice Miller, Hillsboro, and Charles E. Byrne, River Forest, who replaces W. M. Brinkman, Chicago.

Livestock Rate Order Reaffirmed

Upon further hearing to bring the record down to date, the Interstate Commerce Commission has issued a report affirming the findings of its report in the Hoch-Smith investigation of western livestock rates, in which it prescribed maximum rates on edible livestock throughout the western district, except as to certain matters specifically dealt with to correct or prevent abuses and to simplify application of the rates. Commissioner Mahaffie dissented, Commissioner Brainerd dissented in part, and Commissioners Farrell, Eastman, Lee and Tate wrote separate opinions concurring in part.

I. C. C. Investigating Seaboard Air Line and Norfolk Southern

At the request of the Treasury Department and of the court having charge of the receivership of the Seaboard Air Line, the Interstate Commerce Commission's Bureau of Accounts and its Bureau of Service are making an investigation of the accounts and operations of the Seaboard and, at the request of the court, an investigation is also being made of the accounts of the Norfolk Southern, also in receivership.

According to testimony given recently by Commissioner Eastman before a Congressional committee the Treasury's interest is because of the loans made to the Seaboard under Section 210 of the transportation act, amounting to $15,699,887, on which interest amounting to $1,800,316 was in default on October 1. Commissioner McManamy said that the investigation by the Bureau of Service includes matters relating to the operations and practices of the railroads. The accounting investigation also involves an appraisal of the collateral pledged for the loan. Meanwhile the Reconstruction Finance Corporation has withheld authorization of a new loan to the receivers of the Seaboard of $1,500,000 which had been approved by the commission on January 4, over the dissent of Commissioner Mahaffie.

Freight Car Loading

Revenue freight car loading in the week ended January 21 amounted to 496,434 cars, a decrease of 9,888 cars as compared with the previous week and of 65,667 cars as compared with the corresponding week of last year. As compared with 1931 it was a decrease of 219,040 cars. Increases as compared with the preceding week were shown in the loading of l. c. l. merchandise and forest products, and coal showed an increase as compared with last year, but other commodity classifications showed reductions as compared with the previous week and also last year.

For three weeks this year the total loading has been 1,438,408 cars, as compared with 1,706,428 in the corresponding period of 1932 and 2,153,814 in 1931.

In Canada, car loadings for the week ended January 21 totaled 32,872. This was an increase over the previous week of 246 cars. In the same week last year loadings totaled 40,490. Loadings in the first three weeks have totaled 92,280, as compared with 119,516 in 1932 and 127,430 in 1931.

Southern Inaugurates "New Deal" Train Travel Bargains

Continuing the attention-getting publicity methods with which it has been exploiting its passenger rate reductions, the Southern advertised as "A new deal in train travel bargain fares" the reduced-rate round-trip tickets which it sold on January 28 for journeys from North Carolina points to Washington, D. C. Similar "new deal" bargain fares will be available on February 11 from certain North and South Carolina and Virginia and Tennessee points to Jacksonville, Fla.

The "new deal" round-trip fare to washington was $6 and was described in its advertising circular as a "midsummer bargain fare in midwinter." Round-trip Pullman tickets at a reduction of 25 per cent were also available. The $6 rail tickets were valid for the journey to Washington on all Saturday (January 28) trains except the Crescent Limited; and the return limit was Monday, January 30. The special feature of the "new deal" fares, however, is the extension privilege which provides that the return limit may be extended for a period of not exceeding five days upon payment of $1 per day for such extension.

The same arrangements will apply on reduced-fare journeys to Jacksonville over the week-end of February 11 although in this case the return limit on the basic round-trip fare of $10 will be extended an additional day to Tuesday, February 14.

Congress Asked to Halt Work on Missouri River

A resolution asking Congress to discontinue all work now being done on the Missouri river for navigation purposes was adopted by a vote of 55 to 37 in the Nebraska House of Representatives on January 23 over protests of Omaha representatives and out-state members. Representative Crozier of Osceola led the attack on the Missouri river work, contending that various individuals owned equipment used in dredging rivers and also owned land along the river and, therefore, have a selfish motive in advocating the development of the river. "With all the money that is being poured into waterways," he said, "we could build a double track from Lincoln to Galveston, and haul all our wheat and corn for 10 years free."

National Transportation Committee Visits Washington

Members of the National Transportation Committee spent the day in Washington on January 28 and consulted with Chairman Rayburn of the House committee on interstate and foreign commerce, members of the Interstate Commerce Commission and directors of the Reconstruction Finance Corporation on phases of the railroad and transportation situation on which the committee is soon to render a report. B. M. Baruch, vice-chairman of the committee, had previously conferred with Chairman Couzens of the Senate committee on interstate commerce and with President-Elect Roosevelt. It was stated that the committee hopes to have its report ready soon after February 15. The members were accompanied by Dr. H. G. Moulton, of the Brookings Institution, who has been working on a report to the committee.

Howard C. Kidd Dies

Howard C. Kidd, internationally known railroad authority and professor of commerce at the University of Pittsburgh, School of Business Administration, was injured fatally on January 27, when struck by a train while walking in a rainstorm through the Pennsylvania's Pitcairn (Pa.) yards. Dr. Kidd returned recently from a six weeks' trip to South America where he made a study of railways in the Argentine at the request of British financial interests. Two years ago Dr. Kidd was appointed advisor to the Public Service Commission of Pennsylvania on consolidation of railroads. He was born on January 30, 1892, and received his A.B. degree from Geneva University in 1908, his A.M. from Columbia University in 1911, and his Ph.D. from the University of London in 1928. He became assistant professor of economics of the University of Pittsburgh in 1915, leaving four years later to become associate professor of industrial economics at Carnegie Institute of Technology. After spending two years at this work he re-

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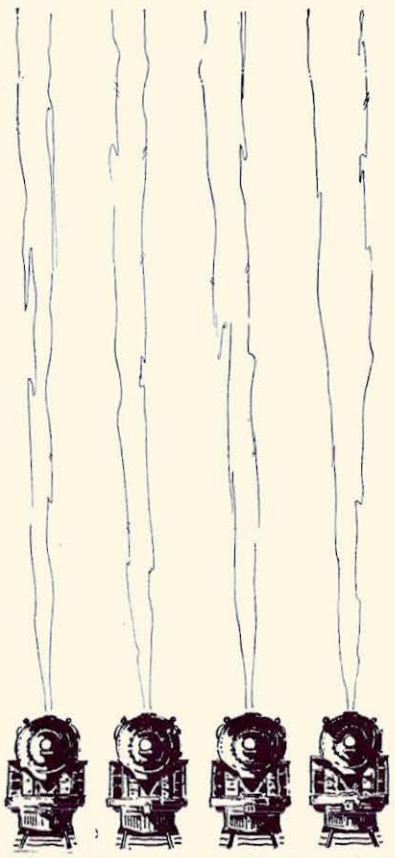
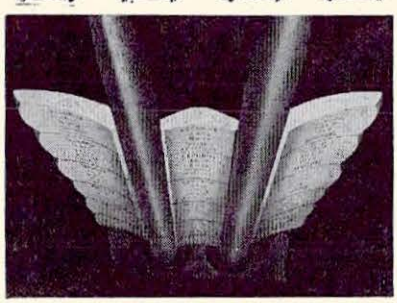
READY
for another year of SERVICE





THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

FOR 22 YEARS American Arch Company has guided locomotive Arch development.

The sectional Arch of the American Arch Company made the locomotive Arch really practical.

Then came the fight for standardization of Arch tube spacing and of Arch brick shapes and sizes. This brought order out of chaos.

Next came the organization of a system of Arch Brick supply that insured having the right brick at the point where it was needed.

American Arch Company service men followed through on Arch Brick and helped get better performance, at the same time offering counsel on various locomotive combustion problems.

Continually for 22 years, American Arch Company engineers have been improving Arch design to keep it abreast of locomotive improvement.

Today, this service to the railroads is being carried forward with continued vigor in an effort to obtain the maximum value from each dollar spent for Arch Brick.

HARBISON-WALKER REFRACTORIES CO.
Refractory Specialists

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Locomotive Combustion Specialists › › ›

turned to the University of Pittsburgh, School of Business Administration, as professor of commerce. Among the writings of Dr. Kidd are "A New Era for British Railways," and a recent study entitled "Regulation of Intercoastal Commerce."

Mail Subsidy for Seatrain Held Up By Congress

A provision that no part of the money appropriated for the Postoffice Department for the fiscal year 1934 shall be paid on the ocean mail subsidy contract to the Seatrain Lines, Inc., was inserted by the Senate in the Treasury and Postoffice appropriation bill on January 30 after a protracted debate, by a vote of 53 to 34. This action re-inserted in the bill a provision in the House bill which had been eliminated by the Senate appropriations committee. The contract provides for payment of $240,000 a year and was entered into on the supposition that the company was to engage in foreign service between New Orleans and Cuba but has since been amended to provide for only partial payment because the company is now engaging in coastwise service between New York and New Orleans via Havana. The company is temporarily operating without any mail payments, under a six-months certificate issued by the Shipping Board.

Freight Cars Must Not Be Run Behind Coaches

The Chicago & Illinois Midland has been denied permission by the Illinois Commerce Commission to operate freight or merchandise cars on the rear of its passenger train between Springfield and Peoria, the commission refusing to upset such an old practice without further investigation. The manner of arranging cars in a mixed train with the passenger coaches in the rear has been in vogue for more than 80 years. The commission further held that the railroad failed to establish what economies if any would be effected or whether the proposed method would be as safe and comfortable for passengers and employes.

A railroad brotherhood sought dismissal of the railroad's plea, contending that the commission has no jurisdiction over the question, as Section 21 of the Fencing and Operating act expressly forbids the proposed practice. The commission denied the brotherhood's motion, holding that the adoption of the Commerce Act had by implication repealed the provisions of Section 21 of the Fencing and Operating Act.

$7,137,639 Recommended for I. C. C.

Appropriations amounting to $7,137,639 for the Interstate Commerce Commission for the fiscal year ending June 30, 1934, were recommended by the House appropriations committee in reporting the independent offices appropriation bill to the House on January 26. This is exactly the amount estimated by the Bureau of the Budget and represents a reduction of $10,921 below the 1933 appropriation and of $2,274,834 below the 1932 appropriation, but, the report shows, the 1933 appropriation was reduced as the result of impoundments under the economy act to $6,549,833, so that the estimate for 1934 reflects an actual increase of $587,806. In order to operate within the present reduced appropriations the commission was compelled to impose drastic administrative furloughs which are estimated to effect a total saving of $770,880 for 1933. These have been applied to every employee on the rolls and will approximate a furlough of one month's duration in addition to the legislative furlough required by the economy act of approximately a month, while many employees were given indefinite furloughs and further reductions in force are now necessary.

The recommended appropriation for valuation is $2,313,542, a reduction of $436,458 as compared with this year's appropriation, but $308,707 was added to that for the Bureau of Accounts, bringing it up to $992,267, offsetting in part the drastic reduction ordered last year. For salaries and expenses the proposed amount is $2,692,313, for safety work, $469,777; for signal safety systems, $37,283; for locomotive safety inspection, $457,457; and for printing and binding, $175,000.

In his testimony before the subcommittee of the appropriations committee in December Commissioner Lewis emphasized the importance of completing the valuation work for use in connection with proposed railroad reorganizations.

Pullman Restaurant Cars Now on 19 Roads

The extent to which Pullman restaurant cars have supplanted dining car service operated by the railroads is shown in the fact that on January 1, 1933, the Pullman commissary department was operating 64 restaurant cars which served full meals on 29 lines, over 19 different railroads. In addition, it operates 171 buffet cars in the United States and 9 in Mexico, in which light repasts are obtainable; 137 composite cars, which may be partly sleeping cars of parlors with lounge and which may be equipped with a soda fountain and sandwich service or a broiler buffet; and 24 private cars which are subject to public demand. The Pullman Company operates all the dining car business on the Mobile & Ohio, the National Railways of Mexico and the Southern Pacific of Mexico and practically all on the Erie, the Chicago Great Western and the Pere Marquette. The rapid development of this business is due in large measure to the prevailing conditions which have concentrated attention upon dining car service. This service has always been operated by the railroads at a loss and has caused the railroads to consider its abandonment.

About half the space on the Pullman restaurant cars consists of compartments or private rooms, or 6 to 10 sleeping sections and, in many cases, the latest parlor equipment. The remainder of the car is occupied by the restaurants and kitchens and a lounge. Provision is made for seating from 8 to 24 persons, varying according to the amount of business upon the different runs. The menus, although simplified, provide table d'hote and a la carte meals. The kitchens are modern in every way, finished throughout in monel metal, including the ranges, sanitary refrigerators and all other necessities and conveniences.

A resume of this service is as follows:

Atlanta & West Point and Western of Alabama—Atlanta and Montgomery, one car.

Atlantic Coast Line—Augusta, Ga., and Florence, S. C., one car; Wilmington, N. C., and Rocky Mount, N. C., one car.

Boston & Maine, Central of Vermont and Canadian National—Boston and Montreal, two cars.

Chesapeake & Ohio—Louisville and Ashland, Ky., three cars. Washington and Huntington, W. Va., two cars.

Chicago & Eastern Illinois—Chicago and St. Louis, two cars.

Chicago Great Western—Kansas City and Minneapolis, four cars; and Chicago and Rochester, Minn., two cars.

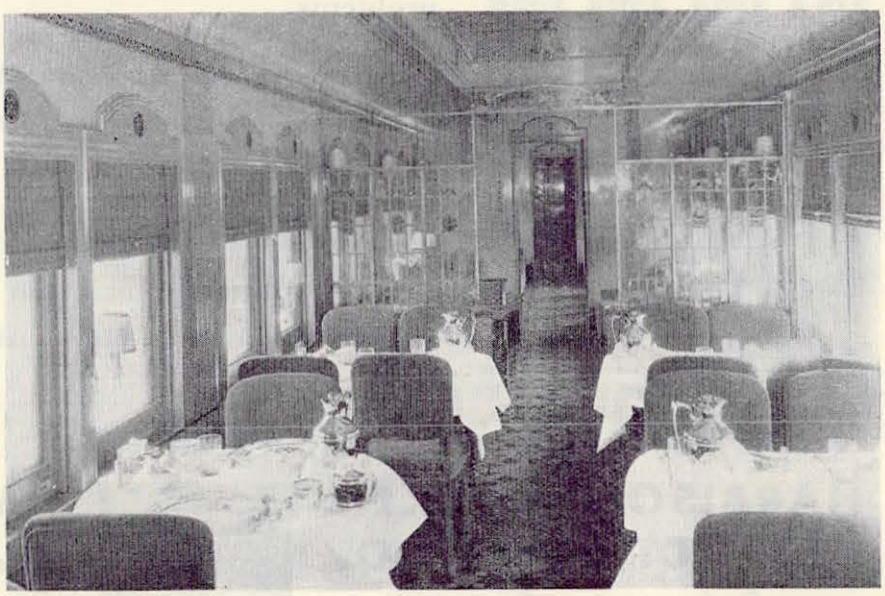
Erie—Chicago and Jersey City, nine cars; and Buffalo and Jersey City, two cars.

Mobile & Ohio—Jackson, Tenn., and Meridian, Miss., one car.

National of Mexico and International—Great Northern-San Antonio and Mexico City, five cars; Mexico City and Guadalajara, two cars; and Mexico City and Juarez and El Paso, six cars.

Pennsylvania—New York and Philadelphia, six cars; Chicago and Cincinnati, two cars; Philadelphia and Pittsburgh, two cars; Pittsburgh and Wilkes-Barre, two cars.

Pere Marquette—Chicago, Grand Rapids and Detroit, five cars.



Pullman Restaurant Car

Southern Pacific of Mexico—Guadalajara and Nogales, Sonora, four cars.
Wabash—Chicago and St. Thomas, Ont., two cars; Minneapolis and St. Louis, St. Louis and St. Paul, two cars.

Among the limited trains on which Pullman club, broiler buffet, lounge, soda fountain and similar service is given are the following:

New York Central—"Twentieth Century," "Lake Shore," "Commodore Vanderbilt," and "Southwestern."
New Haven—"Yankee Clipper" and "Knickerbocker."
Pennsylvania—"Broadway," "Liberty," "American," "Senator," and Manhattan."
Baltimore & Ohio—"Capitol" and "National."
M-K-T—"Texas Special."
Southern, Louisville & Nashville, Pennsylvania and Atlanta & West Point—"Crescent."
Atlantic Coast Line, Florida East Coast, Richmond, Fredericksburg & Potomac & Pennsylvania—"Havana Special."
Great Northern and Burlington—"Empire Builder."
Northwestern, Union Pacific and Southern Pacific—"Los Angeles."
Northwestern and Union Pacific—"Portland Rose."

I. C. C. Examiner Recommends Separate Charges for Lighterage at New York Harbor

The Interstate Commerce Commission on January 28 made public a proposed report of over 200 pages by Examiner Earl M. Steer in the so-called New York lighterage cases, initiated by complaints filed in 1930 by the State of New Jersey, the New Jersey Traffic Advisory Committee, the City of Boston and the Boston Port Authority, in which he recommends that the commission require the railroads to make separate charges for lighterage, car floatage (or trucking in lieu thereof) at New York Harbor and the port of New York, instead of including them in the through rates, on the ground that the present practice is discriminatory against New Jersey points and Boston. The belief is expressed that a charge of 3 cents per 100 lb. or 60 cents a ton on all carload traffic except bulk grain, and 1½ cents per 100 lb. or 30 cents a ton on bulk grain, would be fair and reasonable minimum charges. The proposed report recommends findings which are summarized as follows:

1. Grouping of New Jersey points with New York City, at the same rates on traffic from and to points west of the Hudson River found not unreasonable, unduly prejudicial, or otherwise unlawful, except as noted below.

2. Free lighterage and car floatage or trucking in lieu thereof at New York Harbor, on traffic from and to points west of the Hudson River, found unduly prejudicial to New Jersey points and unduly preferential of New York City and points within the lighterage limits of that harbor. Separate charges required for lighterage and its substitutes on such traffic.

3. Rates to and from points in New England and via the rail and water or rail-water-rail routes to and from points in the South and Southwest found unduly prejudicial to New Jersey points and unduly preferential of New York City. Such preference and prejudice ordered removed.

4. Free lighterage and car floatage or trucking in lieu thereof at the port of New York, on export, import, coastwise, and intercoastal traffic from and to points in New England, found unduly preferential of that port and unduly prejudicial to Boston, Mass. Separate charges required for lighterage and its substitutes on such traffic.

5. Rates on export, import, coastwise, and intercoastal traffic from and to Boston as compared with Philadelphia, Pa., Baltimore, Md., and Hampton Roads, Va., found not unreasonable, unduly prejudicial to Boston, or preferential of the other ports named.

6. Various other issues disposed of as shown in the report. Previous decisions in other cases modified in so far as necessary to carry into effect findings herein.

Motor Carrier Regulatory Bills Filed in New Hampshire

Two bills, designed to regulate motor vehicles transporting property for hire, to place such vehicles under supervision and control of the Public Service Commission and to establish a graduated scale of registration fees leased on weights of such vehicles, have been filed in the New Hampshire House of Representatives.

The bills which were filed by William J. Neal, Lecturer of the State Grange, have the approval of the executive committee of the New Hampshire Railroads Employees & Citizens Association, and of the Boston & Maine and Maine Central.

The bills declare that as a matter of state policy "the business of operation of motor vehicles for hire on the public highways affects the interest of the public." The regulatory bill asserts that "more effective regulation of common carriers and contract carriers is necessary to the end that highways may be rendered safer for the use of the general public; that the wear of such highways may be reduced," and that discrimination in rates may be eliminated and congestion of traffic minimized.

The bill further declares that regulation is necessary in order that the use of the highways for the transportation of property for hire may be restricted by the necessity of the general public. There is no proposal, however, to regulate trucks transporting the property of the owner nor trucks doing business for hire entirely within the limits of any one city or town, or within 10 miles from its borders.

The other bill having to do with fees, does not seek to change, in any way, the present charges against vehicles not exceeding 8,000 lbs. gross weight. For vehicles above that gross weight, the present rates are 60 cents per 100 lbs. The new bill seeks to establish a graduating scale commencing with 65 cents per 100 lbs., for vehicles from 8,000 to 10,000 lbs., rising to $1.75 per 100 lbs., for vehicles and trailers weighing 30,000 to 34,000 lbs.

Bankruptcy Bill Passed by House

The Sumners bill, H. R. 14,359, to amend the federal bankruptcy laws, with provisions for railroad reorganizations without receivership under broad powers in the Interstate Commerce Commission in the initiation, formulation, and approval of reorganization plans requiring acceptance by only two-thirds of the security holders, was passed by the House on January 30 by a vote of 201 to 43, after a brief debate. A summary of its provisions was published in last week's issue.

The bill now goes to the Senate where an effort will be made to substitute for many of its provisions those included in a bill introduced by Senator Hastings, of Delaware, drafted largely by Solicitor General Thacher, which provides for formulation and approval of reorganization plans under the jurisdiction of the commission, but leaves questions of judicial determination to the courts. The railroads have been working for some such bill and favor both in principle, but greatly prefer the provisions of the Hastings bill to that enacted by the House and hope that a satisfactory bill will emerge from conference. The House bill, however, is largely based on suggestions made by advisors of President-Elect Roosevelt and to some extent by members of the Interstate Commerce Commission.

A revision of the somewhat similar bill which has long been under consideration in the Senate judiciary committee was introduced in the Senate on January 28 by Senator Hastings as S. 5551. The bill provides for somewhat less cumbersome machinery than the House bill and its terms would make possible a speedier termination of the proposed reorganization proceedings. Moreover, whereas the House bill rather subordinates the supervision of the courts over reorganization planning to that of the Interstate Commerce Commission, and provides for final court approval of an "accepted and approved plan" submitted to the court by the Interstate Commerce Commission, the Senate bill provides that the commission shall certify its approval, with its findings and conclusions, for confirmation by the court if the plan is satisfactory to it. The Senate bill eliminates the requirement of commission approval before a petition may be filed by a railroad with the court to initiate reorganization proceedings, although it requires commission approval for the filing of such a petition by creditors. It also omits the requirement that a temporary trustee appointed by the court shall be recommended by the commission, although provision is made for such recommendation before the appointment of a trustee is made permanent. In place of the provision for the appointment by the President of special referees, the Senate bill provides for reference of issues to special masters designated by the judges of the circuit court of appeals. Whereas the House bill provides for a re-opening of proceedings before the commission after acceptance of a plan by creditors and stockholders, the Senate bill omits such requirement unless the plan accepted differs from that recommended by the commission.

The House bill provides for a grant of authority by the commission for the issuance of securities before the plan is submitted to the court, apparently on the assumption that the court is expected to approve it. This would bring into play the various procedural steps required under the interstate commerce act in connection with such authorization before a plan was finally confirmed by the court. The Senate bill includes provision for a "railroad corporation not engaged in interstate com-

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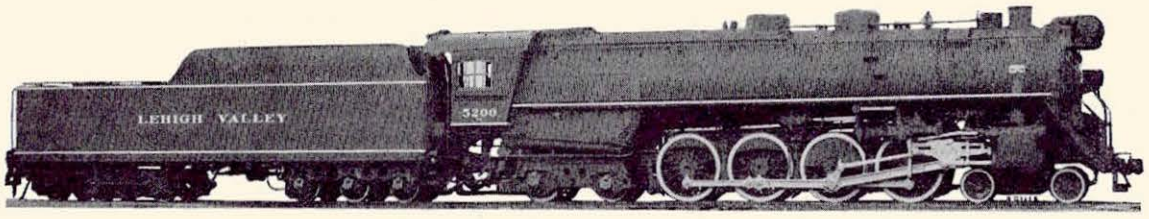
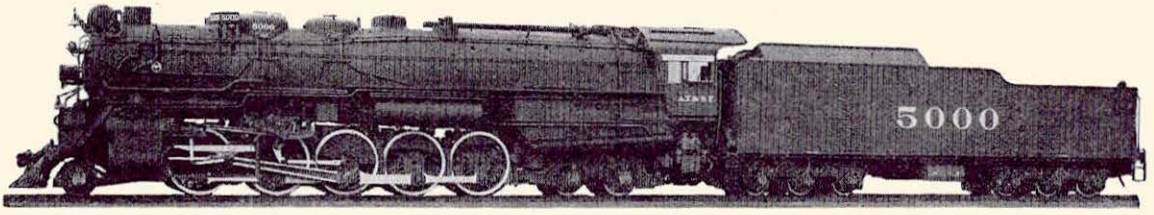
A solution for motive power officials' . . .

Three-



4-8-4 Type Locomotive

Lehigh Valley Railroad Company



2-10-4 Type Locomotive

The Atchison, Topeka & Santa Fe Railway System

These locomotives are setting new records for high efficiency locomotive performance. A return of 38 per cent on the investment is realized by the Lehigh Valley locomotives. The 2-10-4 type on the Santa Fe, when compared with power considered strictly modern five years ago, handles 15 per cent more tonnage in 9 per cent less time and with 17 per cent less coal per 1,000 gross-ton-miles. They are equipped with Elesco type "E" superheaters and Elesco feed water heaters, so necessary for economy of locomotive operation. Each superheater header incorporates an American multiple throttle, which provides ease of handling heavy power.

Superheaters . Feed Water Heaters . Exhaust Steam Injectors

fold Problem

THERE are many ways in which the railways can yet be improved so they will function more efficiently and more economically, thus hastening their return to prosperity. To this end, motive power officials in 1933 are confronted with a three-fold problem, namely:

THE PROBLEM—

(1) replacing power that has long since become unusable through obsolescence.

(2) the betterment of the best of the older locomotives through application of fuel-saving and capacity-increasing devices, made available since these locomotives were built.

(3) repairing existing equipment being kept in regular service.

Now, as never before in the 22 years this company has been serving American railways, this company is better equipped and prepared to help the railroads maintain high standards and establish new records of motive power operation . . . . in these ways:

THE SOLUTION—

(1) On new power, Elesco superheaters and Elesco feed water heating devices will be major factors for the high-speed, heavy-duty operation of today. All Elesco devices have been steadily improved to meet increasing demands. For Elesco superheaters, the improved header combined with American multiple throttle is generally accepted because better handling of a locomotive is afforded by this modern throttle arrangement.

(2) In any betterment program, Elesco feed water heaters and Elesco exhaust steam injectors should be considered for the increased sustained boiler capacity or improved fuel rate they make possible. Also, on existing power, now under-boilered, Elesco type "E" superheaters will give increased boiler capacity with sustained steaming capacity. These improvements can be made at any general shopping.

(3) In the repair of motive power, no parts are more vital or in greater need of special care than are superheater units that have become unserviceable through years of severe operation. Through the Elesco unit remanufacturing service at our plant, unserviceable units are rebuilt at a nominal cost. This is the only means for definitely restoring units to full capacity and full efficiency . . . and giving them renewed life for many years of trouble-free service.

Let us help you on this three-fold motive power problem . . . to continue improvement of steam locomotive operation through 1933.

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.

60 East 42nd Street
NEW YORK

ELESCO

Peoples Gas Building
CHICAGO

Canada: THE SUPERHEATER COMPANY, Limited, Montreal

A-764

Superheated Steam Pyrometers . American Throttles

merce" under the section dealing with corporate reorganization of companies other than railroads.

Pullman Excursions Successful

The experiment of the Pullman Company in reducing sleeping car rates in conjunction with low rail rates has shown remarkable results during the 20 months in which the practice has been in effect. During this period, 350 excursions were operated, varying from 1 or 2 cars to 33, with an average of 170 passengers per excursion. Approximately 6,000 persons were carried in 2,171 cars, an average loading of 27.3 passengers per car. The additional revenue resulting from these operations was satisfactory, even at the reduced rates, and at the same time Pullman service was introduced to a large number of persons to whom it was a new experience.

Having proved that there was a demand for Pullman comforts on week-end excursions, the idea was further extended by offering excursionists the combined attraction of a low railroad fare and a reduced round-trip Pullman rate in connection with excursions where regular lines were used, instead of being confined to special cars operated on special trains. In order to attract travelers who desire to make longer stopovers, many of these excursions allowed return within 30 days.

The roads in the southeastern section of the country were the first to adopt the plan; and these were followed by the Texas lines and the railroads west of Chicago. Last summer another form of reduced rates on round-trip excursions was initiated. Tickets were sold within a 30-day limit from a number of cities in the East to points on the Pacific Coast, to national parks and certain destinations in Utah, Colorado and the Black Hills, as well as to Mexico City, at reductions averaging about 15 per cent. These tickets also allowed many stopovers. Nearly 5,000 persons bought these tickets; and while the sales did not bring this traffic up to the usual figure, they represented a material addition to the revenue which would have been lacking without the stimulation produced by these attractive rates.

R. F. C. Fails to Authorize Some Loans Approved by I. C. C.

Reports submitted to Congress by the Reconstruction Finance Corporation showing the loans it has made to banks, railroads and other companies or institutions indicate that it has not authorized certain loans to railroads, most of them short line railroads, that had been approved by the Interstate Commerce Commission; while the commission itself has declined to approve loans applied for by twenty or more short line applicants. The corporation makes no announcement of its refusal of any loan and the fact that it has not made one does not necessarily indicate that it has refused, because for one reason or another the railroad may not have pressed its application or final action may have been delayed, but the reports so far issued fail to show corporation authorization of loans to about a dozen roads, for which the commission had approved loans; and several of them were the ones as to which one or more commissioners dissented.

So far as amounts are concerned the corporation has authorized most of the loans approved by the commission, although its monthly reports show some lag as compared with the total amount approved by the commission. For the year 1932 it had authorized 104 loans to 62 railroads aggregating $337,435,093, whereas the commission had approved a total of $359,394,439. For several months after its organization the corporation did not make public its action on individual loans, with some exceptions, but on January 26, in response to a House resolution, it submitted a detail report covering the period from February 2 to July 21. For the period since July 21 it has made monthly reports.

Three Class I roads in receivership are among those for whom the Interstate Commerce Commission has approved loans which have not yet appeared in the list of authorizations by the R. F. C. They are the Minneapolis & St. Louis, for which the commission approved $2,698,630; the Missouri & North Arkansas, $400,000; and the Seaboard Air Line, $1,500,000.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City.

ALLIED RAILWAY SUPPLY ASSOCIATION.—F. W. Venton, Crane Company, 836 S. Michigan Ave., Chicago. To meet with Air Brake Association, Car Department Officers' Association, International Railroad Master Blacksmiths' Association, International Railway Fuel Association, International Railway General Foremen's Association, Master Boiler Makers' Association and the Traveling Engineers' Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J. 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Room 800, 1017 Olive St., St. Louis, Mo. Annual meeting, June 13-15, 1933, Cleveland, Ohio.

AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 West Harrison St., Chicago.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. Ry., 836 Federal St., Chicago.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—(See American Transit Association.).

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.
- Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York.
  - Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.
  - Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, June 26-27, 1933, Hotel La Salle, Chicago, Ill.
  - Protective Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, July 12-13, 1933, Stevens Hotel, Chicago, Ill.
  - Safety Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, October 3-5, 1933, Stevens Hotel, Chicago, Ill.
  - Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York. Annual meeting, June 13-15, 1933, Hotel Stevens, Chicago, Ill.
- Division II.—Transportation.—G. W. Covert, 59 East Van Buren St., Chicago.
- Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.
- Division IV.—Engineering.—E. H. Fritch, 59 East Van Buren St., Chicago. Annual meeting, March 14-15, 1933, Palmer House, Chicago.
  - Construction and Maintenance Section.—E. H. Fritch, 59 East Van Buren St., Chicago.
  - Electrical Section.—E. H. Fritch, 59 East Van Buren St., Chicago.
  - Signal Section.—R. H. C. Balliet, 30 Vesey St., New York. Next meeting, May 9-10, 1933, Hotel Roosevelt, New York, N. Y.
- Division V.—Mechanical.—V. R. Hawthorne, 59 East Van Buren St., Chicago.
  - Equipment Painting Section. — V. R. Hawthorne, 59 East Van Buren St., Chicago.
- Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York.
- Division VII.—Freight Claims.—Lewis Pilcher, 59 East Van Buren St., Chicago. Annual meeting, June 6-8, 1933, Brown Hotel, Louisville, Ky.
- Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York.
- Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry. 319 N. Waller Ave., Chicago.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—J. A. Senter, Ind. Agt., N. C. & St. L. Ry., Nashville, Tenn. Annual meeting, June, 1933, Kansas City, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association. Division IV.—E. H. Fritch, 59 East Van Buren St., Chicago, Ill. Annual meeting, March 14-15, 1933, Palmer House, Chicago.

AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.—Miss E. Kramer, M-K-T Employees Magazine, St. Louis, Mo.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St. P. & P. R. R., 11402 Calumet Ave., Chicago. Exhibit by Tool Foremen Suppliers' Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Marion B. Richardson, *Railway Age*, 30 Church St., New York.

AMERICAN TRANSIT ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1104 Chandler Building, Washington, D. C. Annual meeting, 1934, Houston, Tex.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul Minn. Annual meeting, June 21, 1933, Chicago, Ill.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—S. A. Baber, High Grade Manufacturing Co., 10418 St. Clair Ave., Cleveland, Ohio. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month, except June, July, and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 South Morgan Street, Chicago.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago. Regular meetings, second Monday of each month, except June, July, and August, Auditorium Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 So. Main St., Los Angeles, Cal. Club not active at present time.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—J. F. Brady, Main and Barton Sts., St. Louis, Mo. Operation suspended indefinitely.

CENTRAL RAILWAY CLUB OF BUFFALO.—M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 2920 Utopia Place, Hyde Park, Cincinnati, Ohio. Operation suspended indefinitely.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Regular meetings second Monday of each month, except June, July and August, Auditorium, Brotherhood of Railroad Trainmen's Building, West 9th St., and Superior Ave., Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—T. D. Smith, 1660 Old Colony Building, Chicago.

Continued on next left-hand page

MAKE FULL USE OF ALLOY STEELS

LOCOMOTIVES are employing modern alloy steels and irons in ever-increasing quantity. » Rods, axles and pins have long been accepted applications for alloy steels. But progressive roads have not stopped there. Alloy irons and steels are enabling them to combat corrosion in staybolts, tubes and firebox sheets; to lighten weight by using stronger materials; to employ higher pressures safely. » Even now the possibilities have scarcely been scratched. » The future holds forth the increasing use of heat-resisting alloys for tubes and sheets; of alloy steel boiler shells; of wearing surfaces with a hardness and toughness that will give far longer life and reduced maintenance. » Keep informed on alloy steel and iron developments. Consult Republic metallurgists on new applications.

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Staybolts, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Agathon Iron for pins and bushings • Agathon Staybolt Iron • Climax Steel Staybolts • Upson Bolts and Nuts • Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel.

CENTRAL ALLOY DIVISION

REPUBLIC STEEL CORPORATION

MASSILLON OHIO

ACATHON STEELS

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—(See Railway Tie Association.).

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, Suite 322, 910 South Michigan Ave., Chicago.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section (See Safety Section, American Railway Association).

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Statler, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York. Regular meetings third Friday of each month, except June, July and August, 29 W. 39th St., New York City.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings second Thursday of each month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, Transportation Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—P. H. Middleton, (Treas. and Asst. Sec.), First National Bank Building, Chicago, Ill.

RAILWAY CLUB OF PITTSBURGH.— J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Regular meetings, fourth Thursday of each month except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division Purchases and Stores Division and Motor Transport Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division I.

RAILWAY TIE ASSOCIATION.—Roy M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo. Annual meeting, May 10-11, 1933, Jefferson Hotel, Richmond, Va.

RAILWAY TREASURY OFFICERS ASSOCIATION.—L. W. Cox, 1428 Broad Street Station Building, Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Annual meeting, September 19-21, 1933, Hotel Stevens, Chicago, Ill.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Drawer 24, M. P. O., St. Louis, Mo. Meetings temporarily suspended.

SIGNAL APPLIANCE ASSOCIATION.—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York. Meets with A. R. A. Signal Section.

SOCIETY OF OFFICERS, EASTERN ASSOCIATIONS OF RAILROAD VETERANS.—M. W. Jones, Baltimore & Ohio, Mt. Royal Station, Baltimore, Md. Annual meeting, October 7-8, 1933, Scranton, Pa.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S.E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. R. R., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Division V. Equipment Painting Section.

TOOL FOREMEN SUPPLIERS' ASSOCIATION.— E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago, Ill. Meets with American Railway Tool Foremen's Association.

TORONTO RAILWAY CLUB.—N. A. Walford, P. O. Box 8, Terminal "A," Toronto. Regular meetings first Friday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago. Meets with Roadmasters and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, O.

WESTERN RAILWAY CLUB.—J. H. Nash, Dri-Steam Valve Sales Corp., 122 S. Michigan Ave., Chicago. Regular meetings third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago.

Foreign

British Security Holders Form Protective Association

A protective association for holders of British railway securities, to be known as the British Railway Stockholders' Union, has recently been formed by the merger of the Scottish Railway Stockholders' Protection Association, Ltd., the English Railway Stockholders' Protection Association, Ltd., the Railway Reform League and the London & North Eastern Railway Stockholders' Association. This Union has been formed, according to reports received by the Department of Commerce, to protect the interests of all railway security holders in the face of the continuous fall in railway revenues, resulting in the passing of dividends and depreciation in market values of stocks. The Union's immediate object is "to press independently of the railway companies for legislation to enable the railways to compete on terms of equality with road transport; also the national point of view that the railways are, and in the public interest must remain, the chief means of transport, and that their efficiency, so necessary towards the restoration of trade, cannot be maintained without their financial prosperity." Sir Charles Stuart-Williams, who was on the staff of the East Indian Railway from 1900 to 1914 and subsequently chairman of the Commissioners for the Port of Calcutta, is president of the new organization, which will maintain offices at 8 Duke street, Adelphi, London, W. C. 2, England.

Italian Electrification Program

The electrification program of the Italian State Railways for the years from 1932 to 1936 involves an expenditure of 1,200,000,000 lire (approximately $63,120,000), according to information recently issued by the Department of Commerce. On December 1 the Italian Minister of Communications reported that in 10 years of the Fascist regime the length of State Railway lines electrified had grown from 466 to 1,305 miles, and the number of electric locomotives or other traction units in service had increased from 250 to 880, with an accompanying increase in traffic hauled by electric power from 1,712 to 7,945 million ton-miles. The annual saving in coal by the use of electric instead of steam power is estimated to have gone up from 172,000 to 600,000 metric tons. The Minister divided the eventual program for electrification into six main parts, laid out with a view to developments in a future more remote than the next four years. The more ambitious extensions will apply to a number of main lines, which are level and do not pass over any heavy grades. The six sections of the State Railways to be ultimately operated by electricity are indicated as follows: (1) The whole line from Milan to Reggio Calabria in the extreme south on the Straits of Messina, and including the two Milan-Rome lines, one via Genoa and Pisa and the other by way of Bologna and Florence; (2) the lines running from Genoa north to the Swiss frontier via the Simplon and St. Gothard routes; (3) the entire net of State Railway lines in Piedmont and Liguria, now almost completely electrified, and also in Tuscany; (4) the lines connecting Trieste with various crossing points on the northeastern frontier; (5) the line southward from Bolzano to Bologna via Trento and Verna; (6) finishing the electrification on lines centering at Bologna, particularly the road running north to Ferrara and Padua toward Venice, on which traffic has become quite dense. The completion of this program would make the main lines of the State Railways fully electrified. Added to the present total track length of 1,392 miles, either already electrified or in the course of electrification, would be added 2,712 miles, this making the total length of electrically operated lines 4,104 miles, or about 40 per cent of the State Railways' total length. However, the traffic passing over the lines to be electrified would amount to around 60 per cent of all traffic handled by the government lines.

Construction

DELAWARE & HUDSON.—The New York Public Service Commission has approved plans and an estimate of cost for the elimination of a crossing of this road's line and the Wallonsburg-Essex highway in the town and county of Essex. The plans call for the construction of a bridge over the Bouquet river to cost $30,600.

MISSOURI PACIFIC.—A contract has been awarded to M. J. Smith, St. Louis, Mo., for the excavation for a highway subway to carry the Laclede Station road under the tracks of this company at Maplewood, St. Louis county, Mo. The reinforced concrete and steel structure, which will cost approximately $25,000, will be constructed by company forces.

PUBLIC SERVICE COMMISSION OF NEW YORK.—The Public Service Commission of New York has approved as not excessive a bid for the reconstruction of the structure carrying the Owego-Binghamton state highway over the Delaware, Lackawanna & Western in Owego, N. Y. The bid was received from Frank Lewis & Sons, Inc., of Bainbridge, N. Y. The commission has also affirmed its order for the elimination of the Thurston Street crossings of the Delaware, Lackawanna & Western and the Lehigh Valley and the Grand Central Avenue crossing of the Lehigh Valley in Elmira, N. Y.; has approved descriptions and maps showing land and easement rights to be acquired in connection with the elimination of several grade crossings of the Lackawanna and the Erie in Horseheads, N. Y., and Big Flats, and has amended its previous order relating to the elimination of grade crossings in the city of Syracuse, N. Y., so as to permit the Syracuse Grade Crossing Commission instead of the New York Central to prepare necessary plans, specifications and estimates of cost for revising the sewer and water facilities of the city which will be made necessary by the grade crossing elimination work in Syracuse.

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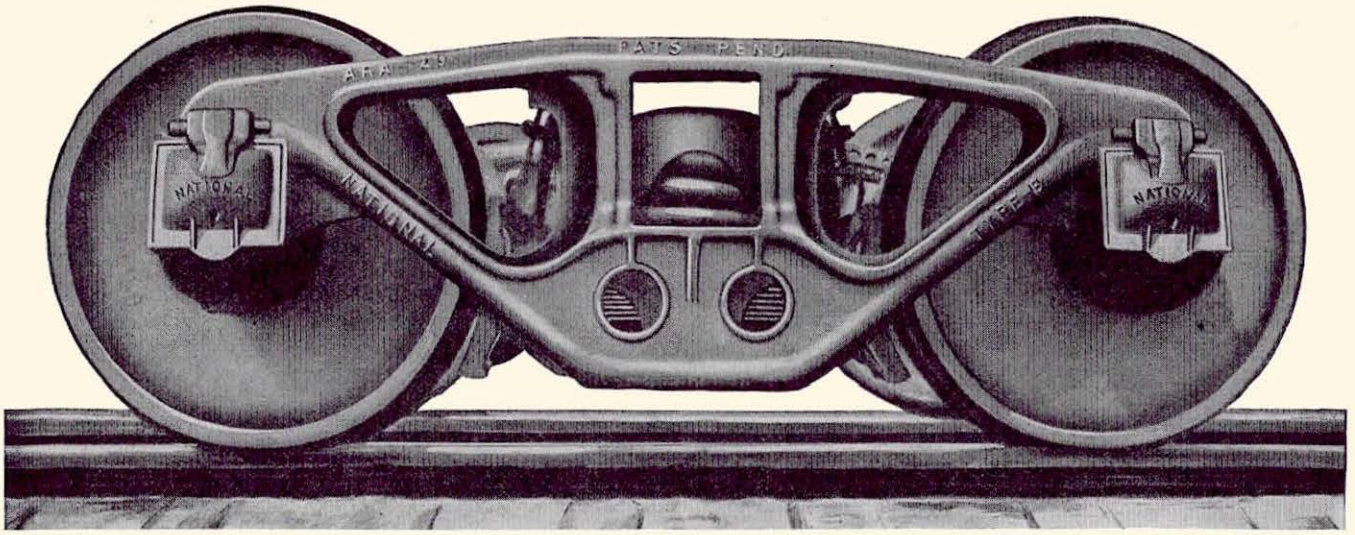
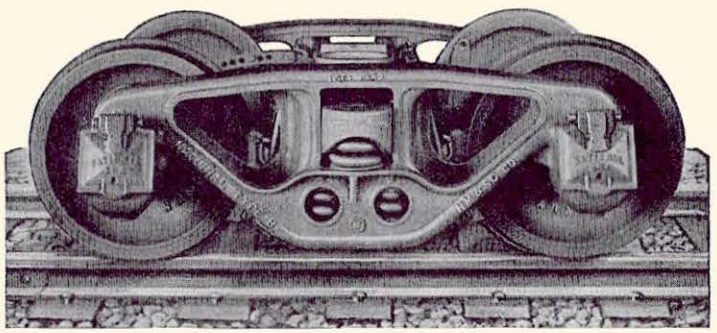


THE NATIONAL TYPE "B" TRUCK

OFFERS OUTSTANDING ADVANTAGES

Less Weight
Greater Strength
Quick Wheel Change
Better Riding Qualities
More Flexibility
Spring Protection
Improved Brake Rigging
More Track Clearance
Simplicity of De gn
Economy

Write for Treatise A-1-32 explaining these and other advantages obtained in the NATIONAL TYPE "B" Truck.



Either the Full Coil or Coil-elliptic spring arrangement can be used with this truck as they are interchangeable.

NATIONAL MALLEABLE & STEEL CASTINGS CO.
General Offices: CLEVELAND, OHIO
Sales Offices: New York, Philadelphia, Washington, Chicago, St. Louis, San Francisco
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

NATIONAL

TYPE "B" M&S Co. TRUCKS

Equipment and Supplies

LOCOMOTIVES

THE GRAND TRUNK has placed an order with the Timken Roller Bearing Company for the application of 40 axle roller bearings on 10 locomotives of the 4-8-4 type.

PASSENGER CARS

THE MISSOURI PACIFIC has ordered air-conditioning equipment for 10 passenger cars as follows: For two Missouri Pacific and three Texas & Pacific lounge cars for use on the Sunshine Special, from the Carrier Engineering Corporation; for two International Great Northern lounge cars operating between Longview, Tex., and San Antonio, from the Westinghouse Electric & Manufacturing Company; and for three Missouri Pacific dining cars operating between St. Louis and Denver, Colo., from the Frigidaire Corporation. The equipment ordered from the Carrier Engineering Corporation is the Carrier-Vacuum type, while that ordered from the other companies is of the mechanical type.

SIGNALING

DELAWARE, LACKAWANNA & WESTERN.—This company has applied to the Interstate Commerce Commission for a modification of its automatic train control orders to permit it to substitute automatic cab signals for automatic train control between East Buffalo, N. Y., and Scranton, Pa.

MACHINERY AND TOOLS

THE DELAWARE, LACKAWANNA & WESTERN expects shortly to be in the market for a number of heavy machine tools.

Supply Trade

The Delaware Steel Service, Inc., Philadelphia, Pa., has been appointed exclusive representative in the Philadelphia district for the **Timken Steel & Tube Company**, Canton, Ohio.

The New York office, railway division of the **Winton Engine Corporation**, has been moved from the Graybar building to 10 East Fortieth street, New York City. **Paul R. Turner** continues in charge as eastern representative.

Scully-Jones & Company, Chicago, manufacturers of production tools and machinery, has acquired the **American Specialty Company** of Chicago. This company has for many years manufactured a complete line of sleeves and sockets.

Harry A. Schultz has been appointed manager of the bureau of safety, sanitation and welfare, of the **United States Steel Corporation**, New York, vice **Charles L. Close**, deceased and **John H. Osmers** has been appointed assistant manager of the bureau, succeeding Mr. Schultz.

M. A. Prud'homme, has been appointed mechanical engineer of the **Dominion Dump Car Co., Limited.** Mr. Prud'homme has been connected with the company for 14 years. The Dominion Dump Car Co., Limited, is the successor to The Hart-Otis Car Co., Limited, with head office at Montreal, Quebec.

The Electric Service Supplies Company, Philadelphia, Pa., has terminated its contract with the **Appleton Electric Company**, Chicago, for the exclusive sale of its Golden Glow floodlight projectors. The Electric Service Supplies Company will in future handle the sale of its product directly through its own distributing organization.

The New Jersey Court of Errors and Appeals, reversing a decree of Vice-Chancellor Bigelow, has set aside the appointment of receivers for the **Pressed Steel Car Company.** The opinion handed down on January 31 was written by Justice Joseph L. Bodine and held that the receivership was "not in the best interests of the public, the creditors and the stockholders."

The assets of the **Locomotive Terminal Improvement Company**, Barrington, Ill., were sold at public auction on January 25. The patents owned and controlled were sold to a syndicate which has licensed the **F. W. Miller Heating Co.**, and **Frederick A. Gale**, vice-president of the National Boiler Washing Co. of Illinois, to continue the installation of locomotive boiler washing systems.

The Peerless Equipment Company, with offices at 310 South Michigan avenue, Chicago, and 230 Park avenue, New York City, has been appointed by the **USL Battery Corporation**, Niagara Falls, N. Y., exclusive railway sales agents for its complete line of USL storage batteries and dry cells for railway service. **H. A. Matthews** and **W. W. Halsey**, formerly connected with USL Battery Corporation, have joined the Peerless Equipment Company organization.

William H. Woodin, president of the **Brill Corporation**, has announced that, effective February 1, all sales and service activities of the **A. C. F. Motors Company** were co-ordinated with those of the **J. G. Brill Company**, Philadelphia, Pa.; both of these latter are subsidiaries of the Brill Corporation. Under this new plan of operation, all matters pertaining to the sale and servicing of A. C. F. motor coaches will be consolidated with the sales and service organization of the J. G. Brill Company, under the direction of **George Frey.** Mr. Frey has for years worked with urban and interurban transportation companies, helping them to meet problems attending the effective co-ordination of rail and motor coach services.

OBITUARY

Albert C. Murphy, representative of the Standard Railway Equipment Company, Chicago, and the Union Metal Products Company of Canada, Ltd., and president of the Federal Railway Devices Company and the Canadian Appliance Company, died in Los Angeles, Cal., on January 25. He was the son of Peter H. Murphy, founder of the P. H. Murphy Company, St. Louis, Mo., and a brother of Walter P. and Dwight Murphy. He

Albert C. Murphy

was born in Bucyrus, Ohio, on June 25, 1877, and entered railway service as an apprentice in the shops of the St. Louis Southwestern at Pine Bluff, Ark., after which he took charge of the manufacturing plant of the P. H. Murphy Company, East St. Louis, Ill. Several years later he entered the sales department of the Standard Railway Equipment Company. He was also interested in several other enterprises, doing business in the United States and Canada, and was active in developing different freight car specialties.

Financial

CHESAPEAKE BEACH.—*R. F. C. Loan.*—This company, which applied to the Reconstruction Finance Corporation in September for a loan of $900,000 to finance its proposed ferry extension across Chesapeake Bay, in December filed a supplemental application reducing the amount asked to $525,000 and in January another reducing the amount to $425,000, proposing to finance the remainder of the cost in other ways.

CINCINNATI UNION TERMINAL COMPANY.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $12,000,000 of first mortgage 5 per cent bonds for the purpose of paying its loan from the Reconstruction Finance Corporation of $10,398,925 and completing the construction of its terminal facilities at Cincinnati. The application states that conditions in the bond market are becoming more favorable and that it is about to conclude a contract for the sale of the bonds to J. P. Morgan & Co., and Kuhn, Loeb & Co., at 97½. The bankers are offering the issue at par.

DELAWARE, LACKAWANNA & WESTERN. —*Pledge of Bonds.*—The Interstate Com-

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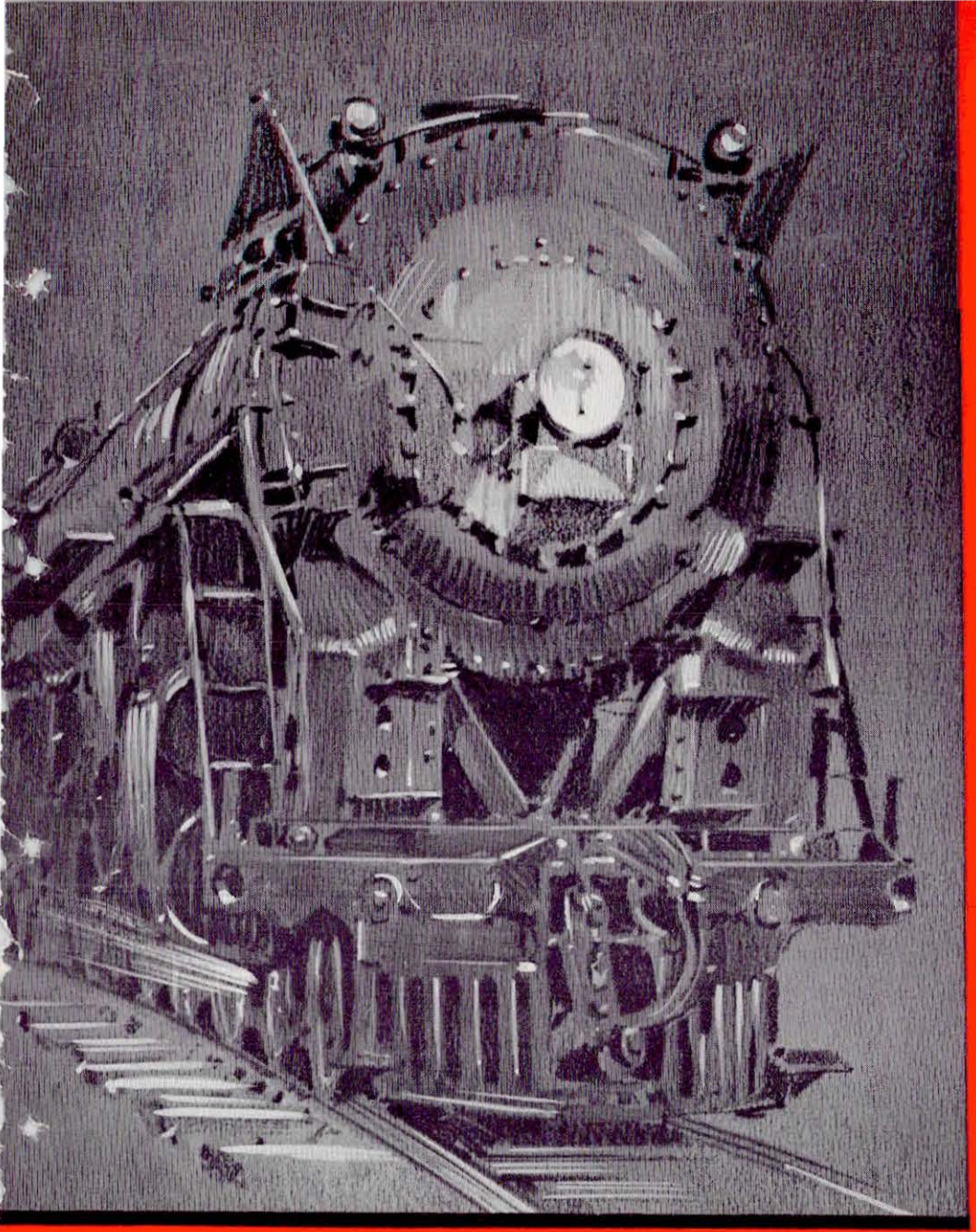


You CAN'T COMPETE WITH ENGINES OBSOLETE

Alco

To ECONOMIZE—

"THE railroads have plenty of locomotives and therefore no new buying of locomotives will take place until there has been a material pick up in traffic."

We wonder how this statement has received the wide circulation and belief that it has.

True, the railroads have plenty of locomotives when one considers numbers only. But why is it that locomotives seem to be different from all other production machines—that progress that has been made in the art of locomotive designing is not given much thought—that the earning power of the modern locomotive of today and its maintenance, as compared with the earning power of a locomotive built 10 to 20 or more years ago and its maintenance, seems not worthy of consideration? Why is it that no matter how old the locomotive is, as long as it can be steamed up and is able to run, it is counted as one locomotive available for service just the same as a new modern engine? It is hard to understand how this practice has become so standardized.

LOCOMOTIVES ORDERED IN U. S.

Year	Locos.	Year	Locos.	Year	Locos.	Year	Locos.
1901	4340	1909	3350	1917	2704	1925	1055
1902	4665	1910	3787	1918	2593	1926	1301
1903	3283	1911	2850	1919	214	1927	734
1904	2538	1912	4515	1920	1998	1928	603
1905	6265	1913	3467	1921	239	1929	1212
1906	5642	1914	1265	1922	2600	1930	440
1907	3482	1915	1612	1923	1944	1931	235
1908	1182	1916	2910	1924	1413	1932	0

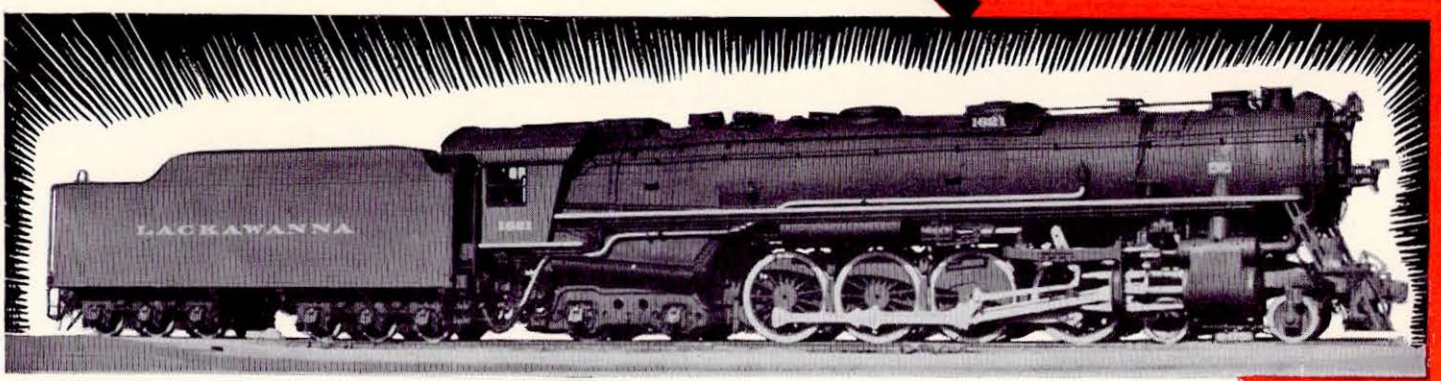
Now, let us take a look at this locomotive inventory and see if we can get an idea of just what has been going on and where we are headed.

The table above lists locomotive orders placed per year starting with the year 1901.

Freight will never pay...

-MODERNIZE

Alco



During these 32 years it will be noticed that the average number of locomotives bought per year has steadily declined. For instance, taking 8 year periods, the average number of locomotives bought per year in the period from 1901 to 1908 was 3925; from 1909 to 1916 the average per year was 2970; from 1917 to 1924 the average per year was 1713; and from 1925 to 1932 the average purchased per year was 697.

Now, in the early years, in fact up until approximately 1918, revenue ton-miles doubled every twelve years, and this regular increase in traffic with its constant demand for more locomotives, kept the locomotive inventory reasonably in step with the then developments in locomotive design. And the number of locomotives included in this inventory increased until in 1924 it reached its peak of 65,358 units.

But what has happened since? The rate of increase in traffic slowed up, and with it the number of locomotives bought per year, and also the number of locomotives in the total inventory fell off sharply.

The locomotive inventory at the end of 1931 amounted to 58,652 units. Of course, the locomotive of today is a far more powerful unit and that has had some effect — but more about that later.

During the last eight years the average number of locomotives bought per year has amounted to 697; during the last six years the average per year has been 537 new units; and during the last three years the average per year has been 225.

And in the meantime, what has been happening to the locomotive inventory? Of the total of 58,652 units available for service at the end of 1931, less than 17 per cent were built within the past ten years; approximately 30.5 per cent, or about 17,900 locomotives were between 10 and 20 years old; and the remaining 52.5 per cent, or about 30,800 locomotives were over 20 years old.

Now, couple with this condition the fact that greater improvements have been made

with engines passé

Alco

MODERNIZE TO ECONOMIZE

in the development of steam locomotives in the past ten years than during any similar period in history, and does not the conclusion stand right out that the factor of obsolescence (something which in years gone by was automatically taken care of by the demands of increased traffic) is rapidly becoming a factor of prime importance.

Now, let us take a look into the future. Taking into consideration the increased power of the modern locomotive, the locomotive inventory, if comprised entirely of up-to-date engines, could probably be reduced to approximately 40,000 to 42,000 units.

At the rate of 700 new units per year, the actual rate for the past eight years, it will take 60 years to turn this inventory over.

We would then have a total inventory of 42,000 units, 7,000 of which would be 10 years old or less; 7,000 would be from 10 to 20 years old; 7,000 would be from 20 to 30 years old; and 21,000 would be from 30 to 60 years old.

Wouldn't we then have a far worse obsolescence factor than we have today?

And wouldn't our railroads in the meantime not only have lost all the increased earning power that the modern engine can give, but also be faced year by year with a staggering increase in maintenance costs?

It will pay to modernize.

The money now lost will more than pay the cost.

American Locomotive Company
30 Church Street New York N.Y.

merce Commission has authorized this company to pledge with the Railroad Credit Corporation $1,193,000 of Oswego & Syracuse 5 per cent, series A first and refunding mortgage bonds; $443,000 of Valley R. R. 5 per cent, series A first and refunding mortgage bonds; and $207,000 of Greene R. R. 5 per cent, series A first and refunding mortgage bonds—all as security for a note of $1,000,000.

ERIE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to extend for five years the maturity of $4,616,000 of New York & Erie third mortgage extended 4½ per cent bonds which mature March 1.

MERIDIAN & BIGBEE RIVER.—*R. F. C. Loan.*—The Interstate Commerce Commission has approved a loan of $600,000 to this company from the Reconstruction Finance Corporation on its application for $864,654 for the construction of an extension of its line from Cromwell, Miss., to Myrtlewood, Ala. The commission had previously approved a loan to this company upon conditions that it be guaranteed by connecting lines but the company was unable to comply with the condition. Since then its affairs have been placed in charge of new officers.

MISSOURI PACIFIC.—*R. F. C. Loan.*—The Interstate Commerce Commission on January 26 approved an additional loan of $1,300,000 to this company from the Reconstruction Finance Corporation by amending its certificate issued on January 4, which had authorized a further loan of $2,500,000, to increase the amount to $3,800,000. The additional amount was to meet requirements of principal and interest on February 1.

The Reconstruction Finance Corporation on January 31 authorized an immediate advance of a sufficient amount of the loan to enable it to pay interest due on February 1.

NEW YORK CENTRAL.—*Union Pacific Representation on Board.*—Counsel for F. W. Charske, chairman of the executive committee of the Union Pacific, who has filed with the Interstate Commerce Commission an application for authority to serve as a director of the New York Central, has filed a memorandum in reply to a suggestion by the director of the Bureau of Finance of the commission that the application be withdrawn as not in conformity with the views of the commission regarding common directors in railroad systems The reply states that the purpose is to continue the representation which the Union Pacific has had on the New York Central board since E. H. Harriman became a director in 1909 and that there is not competition between the systems.

PERE MARQUETTE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon the line extending from Mears Junction, Mich., to Pentwater, 6.8 miles.

SEABOARD AIR LINE.—*Abandonment of Raleigh & Charleston.*—The Interstate Commerce Commission has authorized the Raleigh & Charleston to abandon that portion of its line extending from Lumberton, S. C., to a point near Lakeview, 22.7 miles.

SEABOARD AIR LINE.—*Abandonment.*—The receivers have applied to the Interstate Commerce Commission for authority to abandon part of the line of the East & West Coast from Arcadia, Fla., to Manatee, 45.65 miles.

ST. LOUIS SOUTHWESTERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Prestridge to White City, Tex., 30 miles.

TONOPAH & GOLDFIELD.—*R. F. C. Loan.*—The receiver has applied to the Reconstruction Finance Corporation for a loan of $30,000.

UNION PACIFIC.—*Unification.*—Division 4 of the Interstate Commerce Commission has issued a report finding that the proposed lease of the properties of the Oregon Short Line, the Oregon-Washington, the Los Angeles & Salt Lake, and the St. Joseph & Grand Island on a year-to-year basis, would be in the public interest, subject to acceptance of a condition that the Union Pacific agree to abide by such findings as the commission may hereafter make with respect to the acquisition of the Laramie, North Park & Western and the Pacific & Idaho Northern at their commercial value, or the operation thereof, or both, that may be made in an ancillary proceeding. No order was entered and the proceeding will be held open for 60 days to permit the filing of such an agreement. Commissioner Mahaffie dissented, saying the application should be approved without the condition and the Union Pacific permitted to save the $600,000 which it is estimated could be saved by elimination of duplicate and unnecessary accounting.

Average Prices of Stocks and of Bonds

	Jan. 31	Last week	Last year
Average price of 20 representative railway stocks..	26.81	25.50	33.36
Average price of 20 representative railway bonds..	58.88	58.13	69.95

Dividends Declared

Boston & Providence.—$2.125, quarterly, payable April 1 to holders of record March 20.

Cincinnati Northern.—6 Per Cent, semi-annually, payable January 31 to holders of record January 21.

Cleveland & Pittsburgh.—Guaranteed, 87½c, quarterly; Special Guaranteed, 50c, quarterly, both payable March 1 to holders of record February 10.

Erie & Kalamazoo.—$1.63, semi-annually, payable February 1 to holders of record January 26.

Erie & Pittsburgh.—7 Per Cent Guaranteed, 87½c, quarterly; Guaranteed Betterment, 80c, quarterly, both payable March 1 to holders of record February 28.

Norfolk & Western.—Common, $2.00, quarterly, payable March 18 to holders of record February 28.

Northern R. R. of New Jersey.—4 Per Cent Guaranteed, $1.00, quarterly, payable March 1 to holders of record December 18.

Pennsylvania.—50c, payable March 15 to holders of record February 15.

Pittsburgh, Fort Wayne & Chicago.—1¾ per cent, quarterly; 7 Per Cent Preferred, 1¾ per cent, both payable April 4 to holders of record March 10.

Pittsburgh, Youngstown & Ashtabula.—7 Per Cent Preferred, 1¾ per cent, payable March 1 to holders of record February 20.

Reading.—First Preferred, 50c, quarterly, payable March 9 to holders of record February 16.

Utica Clinton & Binghamton.—1 per cent, quarterly, payable February 10 to holders of record January 31.

Railway Officers

EXECUTIVE

H. W. Anderson, co-receiver of the Seaboard Air Line, has been appointed also co-receiver of the Chesterfield & Lancaster.

J. A. Hulen has resigned as president of the Burlington-Rock Island, and **J. E. Gorman** has been appointed to succeed Mr. Hulen. **A. G. Whittington** has been appointed vice-president.

FINANCIAL, LEGAL AND ACCOUNTING

Henry A. Stahl, assistant treasurer of the New York Central, retired under the pension rules of the company effective February 1. Mr. Stahl was born at Black Rock, N. Y., and after completing his education in Buffalo studied civil engineering under George E. Mann, of Buffalo, N. Y. In 1886, he entered the service of the Minnesota & North Western (now

Henry A. Stahl

Chicago Great Western) at St. Paul, Minn., and was successively, until August, 1898, draftsman, assistant engineer, and assistant chief engineer. He went with the New York Central in 1898 as office engineer. He was subsequently, 1908 to 1917, secretary to the committee on expenditures and board of review; 1918 to 1920, secretary to the president; 1920 to 1923, assistant to general treasurer; 1923 to July 1, 1932, assistant general treasurer, and, on re-organization of the treasury department, July 1, 1932, to January 31, 1933, was assistant treasurer.

OPERATING

Effective February 1, the Buffalo-Rochester district and the Pennsylvania district of the Baltimore & Ohio were consolidated to form the Pennsylvania-New York district under the jurisdiction of **E. A. Peck,** general superintendent, with headquarters at Pittsburgh, Pa., and the

Continued on next page

position of general superintendent at Du Bois, Pa., was abolished. The headquarters of **A. M. Darlow,** assistant general superintendent at Du Bois is now located at Rochester, N. Y. The Niagara division and the Du Bois division have been consolidated and in future will be known as the Buffalo division, and **M. S. Kopp** has been appointed superintendent, with headquarters at Punxsutawney, Pa., and the office of superintendent at Rochester, N. Y., has been abolished. The headquarters of **J. D. Beltz,** superintendent of the Pittsburgh division formerly at Connollsville, Pa., is now located at Pittsburgh. The Akron division and the Chicago division were consolidated forming the Akron-Chicago division, and **T. K. Faherty** has been appointed superintendent, with headquarters at Akron, Ohio, and the office of superintendent at Garrott, Ind., was abolished. That portion of the Akron division, Holloway to Lorain and Cleveland (Cleveland excluded) became a part of the Wheeling division, West Virginia district, eastern lines, under the jurisdiction of **J. M. Scott,** general superintendent, and **C. B. Gorsuch,** superintendent, with headquarters at Wheeling, W. Va. That portion of the Wheeling division, Fairmont, W. Va., to Moundsville, W. Va., (Moundsville excluded) and Hartzel, W. Va., to Brooklyn Jct., W. Va., (Brooklyn Jct. excluded) is now a part of the Monongah division, under the jurisdiction of **H. R. Gibson,** superintendent, with headquarters at Grafton, W. Va. That portion of the St. Louis division, Midland City, Ohio, (Midland City excluded) to Columbus, Ohio, became a part of the Newark division, under the jurisdiction of **C. G. Stevens,** superintendent with headquarters at Newark, Ohio.

W. C. Baisinger, assistant superintendent of the Oklahoma division of the Atchison, Topeka & Santa Fe, has been promoted to superintendent of that division, with headquarters as before at Arkansas City, Kan., succeeding **James E. McMahon,** deceased. The position of assistant superintendent of this division has been abolished.

ENGINEERING AND SIGNALING

A. S. Gunn, construction engineer of the Canadian National, with headquarters at Moncton, N. B., has been appointed engineer, right of way, Atlantic region, succeeding **E. G. Evans,** retired. The position of construction engineer has been abolished.

PURCHASES AND STORES

U. K. Hall, general storekeeper of the Union Pacific System, has been promoted to general purchasing agent in charge of purchases and stores, with headquarters as before at Omaha, Neb. In this appointment Mr. Hall succeeds to a position that has been vacant since the death of **G. W. Bichlmeir** on October 23, 1932. Mr. Hall, who was born on September 12, 1878, at Portland, Ore., entered railway service in 1897 with the Union Pacific System, and has advanced through various positions in the purchasing, accounting, operating, engineering and stores departments. He was appointed general storekeeper of the Oregon-Washington Railroad & Navigation Co. (a unit of the Union Pacific System) at Portland, Ore., in 1913, which position he held until 1916 when he was sent to Omaha as general storekeeper of

U. K. Hall

the Union Pacific Railroad. During the World War Mr. Hall was stationed at Washington, D. C., as assistant to the manager of stores of the United States Railroad Administration. Following the war he was appointed general supervisor of stores of the Union Pacific System, which position he held until April, 1932, when he was appointed to the newly-created position of general storekeeper of the system.

OBITUARY

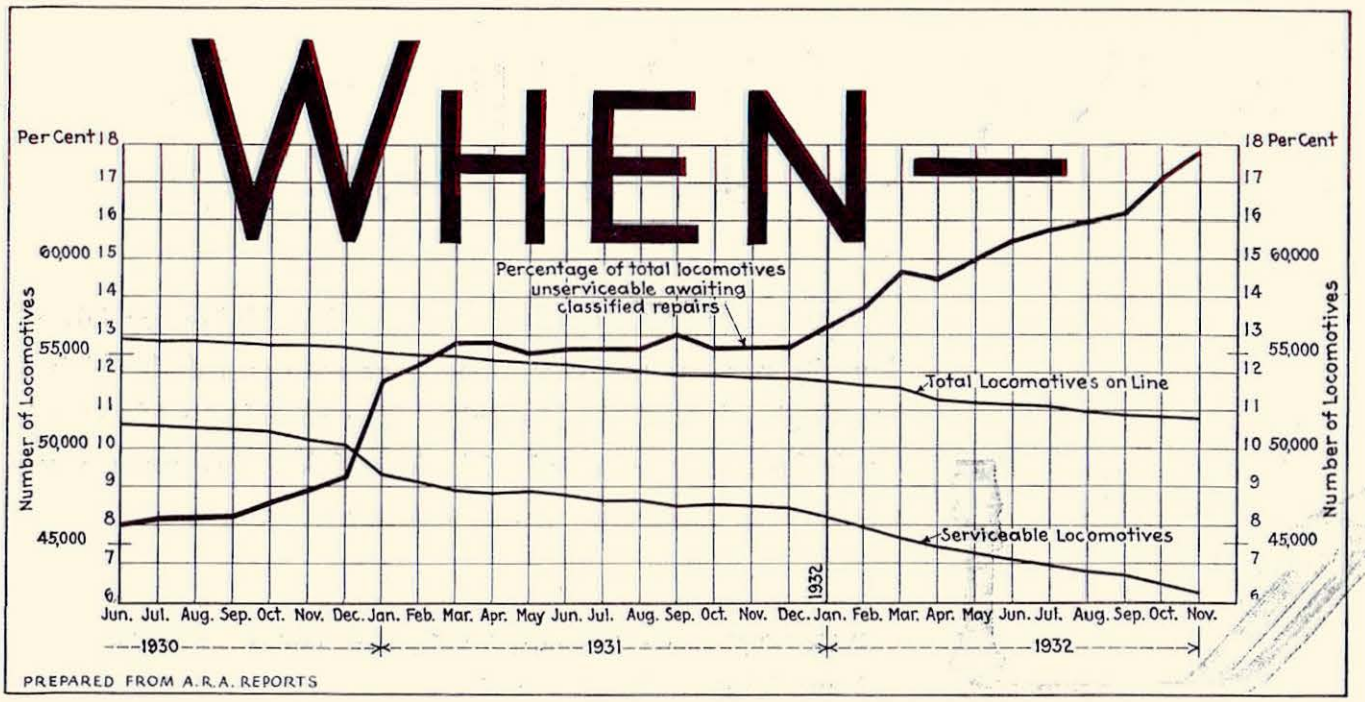
James C. McMahon, superintendent of the Oklahoma division of the Atchison, Topeka & Santa Fe, with headquarters at Arkansas City, Kan., died at Albuquerque, N. M., on January 23 after a long illness. Mr. McMahon was born on April 15, 1866, in Manitowoc county, Wis., and after a public school education entered railway service in July, 1880, with the Union Pacific. Subsequently he left this road to go with the Santa Fe, where he became a trainmaster at Las Vegas, N. M. In December, 1910, he was advanced to superintendent of the Pecos division, with headquarters at Clovis, N. M. Three years later he was transferred to the Colorado division at Pueblo, Colo., and in 1918, he was again transferred to the Oklahoma division, with headquarters at Arkansas City, where he remained until his death.

Herbert R. Saunders, superintendent of the Chicago Terminal division of the Chicago, Rock Island & Pacific, at Chicago, died suddenly on January 26. Mr. Saunders had been connected with the operating department of the Rock Island continuously for 53 years. He was born on June 3, 1866, at Aurora, Ill., and after a high-school education he entered the service of the Rock Island as a yard clerk in 1880, serving in this position and as an agent at various points until 1893, when he was appointed chief clerk at Blue Island, Ill. In 1894, Mr. Saunders was advanced to assistant general yardmaster and a year later he was made trainmaster at Chickasha, Okla., where he remained until 1906, when he was advanced to division superintendent at Kansas City, Mo., serving in this position until 1918, when he was transferred to Amarillo, Tex. After six months Mr. Saunders was again transferred to El Reno, Okla., where he remained until 1921, when he was appointed superintendent of the Chicago Terminal division, the position he was holding at the time of his death.

Elias R. Newman, special traffic representative of the Wabash, with headquarters at Chicago, died in Wilmette, Ill., on January 24. He graduated from Northwestern University in 1877 and entered railway service in April of the same year with the Chicago & Paducah, which was later absorbed by the Wabash. In 1893, he was appointed assistant freight traffic manager, with headquarters at Chicago, which position he held until 1925, when he was made special freight traffic representative, the position he was holding at the time of his death.

T. T. Maxey, special representative of J. M. Davis, president of the Delaware, Lackawanna & Western, died at his home in New York on January 31. Mr. Maxey was born near St. Louis, Mo. He spent three years in development and management in connection with the World's Fair in St. Louis for which he was decorated by the French government, and was the youngest officer in the organization to receive a foreign decoration. Shortly thereafter he began his railroad career with the St. Louis-San Francisco as stenographer in the general manager's office. In 1905 he became assistant secretary to the assistant to the president of the old Great Central Route at Cincinnati. When that line was absorbed by the Erie, Mr. Maxey went to New York as assistant secretary to the assistant to the operating vice-president. In 1906 he became assistant to the assistant general manager of the American Graphophone Company of New York. Later he served as manager of the mail order department of the Columbia Phonograph Company. Then he spent a period in business for himself at Seattle, Wash. Thereafter he returned to St. Louis and entered the service of the Chicago, Burlington & Quincy as stenographer. Shortly afterward he became secretary to the general passenger agent. In 1910 he was appointed advertising agent at Chicago. During the World War he was a member of the Troop Moving Division at Chicago. At this time he also was vice-chairman of the Western Lines Advertising Committee. He served for a time at Washington in the Bureau of Suggestions and Complaints, U. S. R. A. In March, 1921, Mr. Maxey returned to the Chicago, Burlington & Quincy as general advertising agent. In September, 1923, he left railroad service returning to it in 1927, when he went to Halethorpe, Md., as assistant centenary director in charge of publicity for the Baltimore & Ohio's Centenary Exposition. He was appointed special representative of President Davis of the Lackawanna on January 1, 1928, which position he held until his death.

WHEN—



—They Go In For Repairs

IN spite of the fact that 18% of the locomotives are unserviceable, the situation is comparable to that of an army winning a battle against insurmountable odds with minimum casualties.

The lines are holding fast—the forces of "General Depression" are almost exhausted. Ammunition from the R. F. C. has wiped out financial obstacles—increasing car loadings promise early relief and maintenance appropriations.

The first requisitions will call for materials—a decisive victory depends upon selection. Application of HUNT-SPILLER *Air Furnace* GUN IRON to the locomotives awaiting repairs will eliminate many problems and reduce future operating costs. Complete standardization of the parts listed below offers maximum economies.

HSGI
Reg. U. S. Trade Mark

Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings

Parts Finished For Application

Dunbar Sectional Type Packing
Duplex Sectional Type Packing for Cylinders and Valves
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER MFG. CORPORATION
J.G. Platt, Pres. & Gen. Mgr. V.W. Ellet, Vice-President.

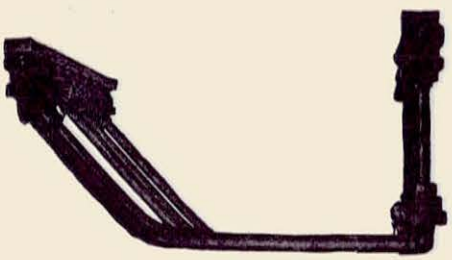
Office & Works
383 Dorchester Ave. South Boston, 27, Mass.
Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER GUN IRON

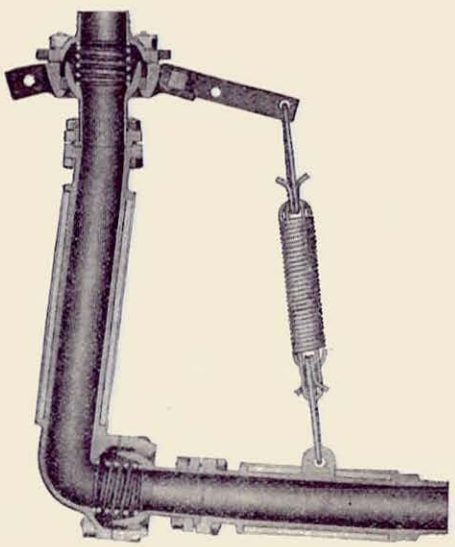
Air Furnace

Service —

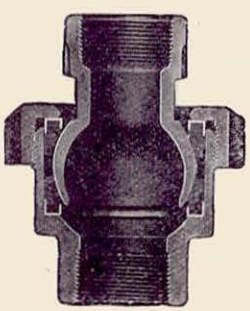
BARCO PRODUCTS are few, but highly specialized. For the past twenty years they have maintained the highest standards of quality and service. The confidence of the railroads has been rewarded with dependable performance and outstanding economies in maintenance of equipment.



BARCO 3V metallic connections between engine and tender insure long, trouble-free service without leakage. Failures and delays are reduced to a minimum. Considering their very low initial cost and extremely low cost of maintenance, railroads can no longer afford the old-fashioned substitutes. Every locomotive worth operating should be equipped with these connections.



BARCO 2″ Metallic Steam Heat Connections on rear of tender and between passenger cars provide maximum movement with minimum number of 90-degree bends, running an entire steam heat season without repairs. They do not leak—the first cost is low and the cost of maintenance is exceptionally low as proven by performance reports from many leading railroads.

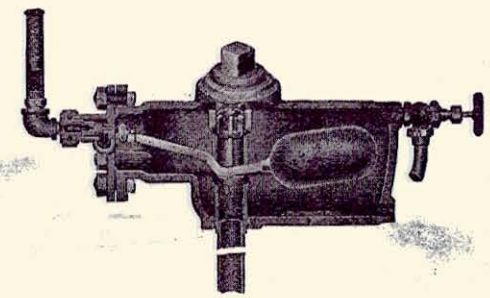


BARCO Flexible Joints are saving thousands of dollars annually in engine-terminals, coach yards, stations and shops. There are many vital spots in locomotive piping to auxiliary devices where the application of BARCO Flexible Joints has proven to be a big factor in the elimination of failures on the road and costly roundhouse maintenance.

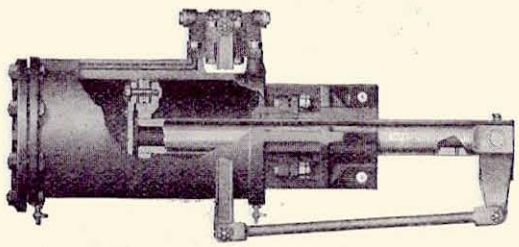
BARCO

Economy

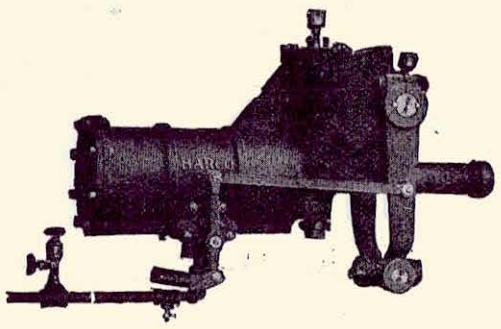
BARCO PRODUCTS will, in a small but important way, help to solve many of the intricate problems of 1933. Their dependable performance and economical service will relieve you of many worries and reduce operating expenses.



BARCO low water alarms give ample warning in time to prevent disastrous boiler explosions and burned crown sheets. In addition to this vital protection they offer a substantial saving in maintenance costs by eliminating the cause for high water levels. The cheapest and most complete boiler insurance available.



The BARCO (type) M-1 Power Reverse Gear with its entirely new design of dual-control value provides close adjustment and accurate maintenance of point of cut-off and low cost of maintenance.



The BARCO (type) B-4 Power Reverse Gear with alloy steel worm and gear provides for accurate holding of the selected point of cut-off without depending upon balanced air pressure. By the use of metal piston rings and the elimination of piston rod packing maintenance costs have been reduced to a negligible item.

Barco Manufacturing Co.

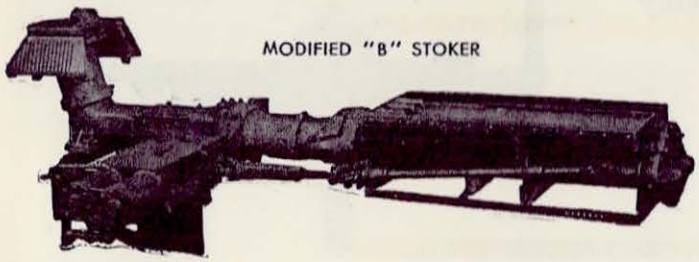
1801 Winnemac Avenue, Chicago, Illinois
THE HOLDEN CO., LTD.

In Canada
Montreal—Moncton—Toronto

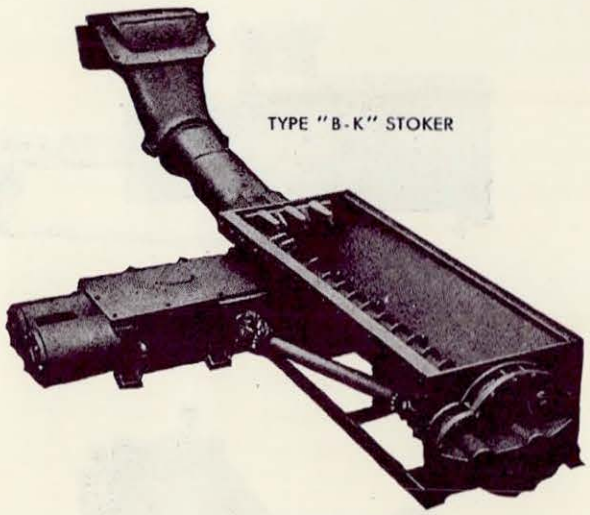
In Canada
Winnipeg—Vancouver

PRODUCTS

GOOD RAIL



MODIFIED "B" STOKER



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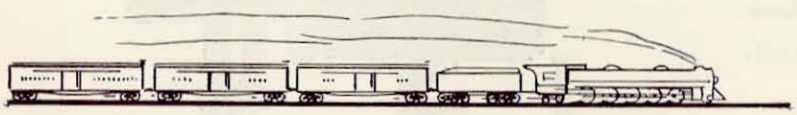

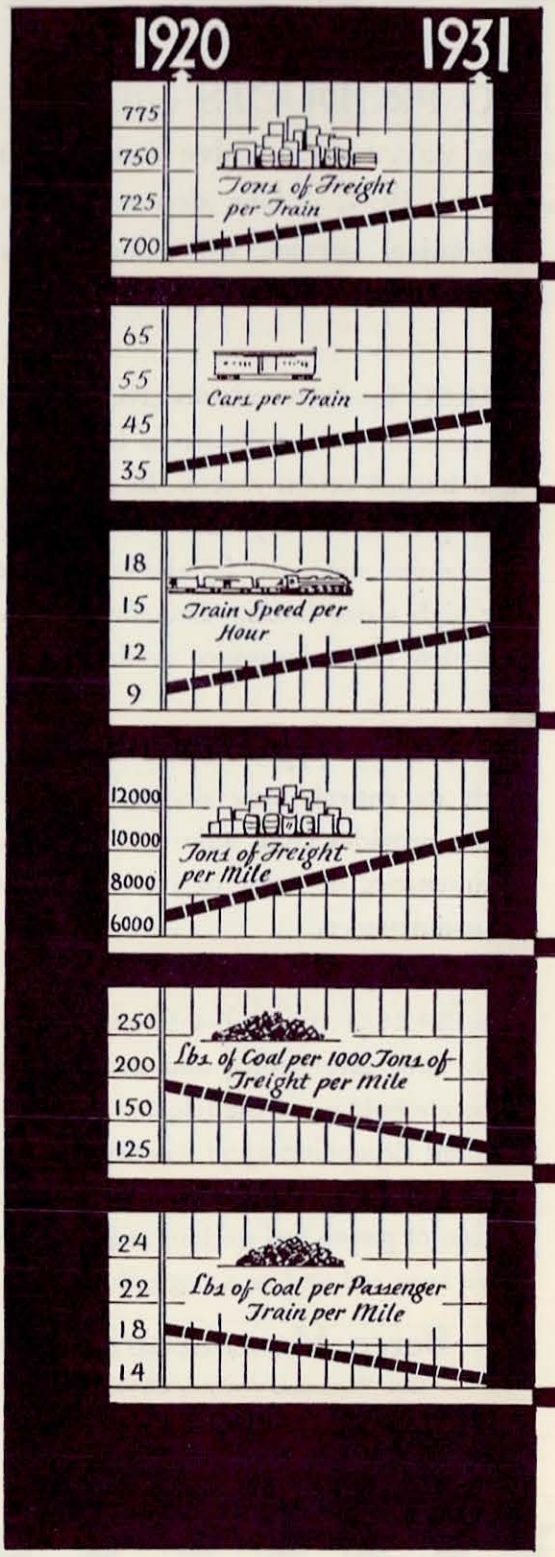

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ROADING!

In 1920 the average freight train carried 708 tons of freight; in 1931 this figure had been increased to 733 tons, an increase of 4 per cent.

In 1920 the average freight train consisted of 37 cars; in 1931 this figure had been increased to 48 cars, an increase of 30 per cent.

In 1920 average freight train speed (counting all stops) was 10.3 miles per hour; in 1931 this figure had been increased to 14.8 miles per hour, an increase of 44 per cent.

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In 1920 197 pounds of coal were required in freight service to move 1,000 tons of freight and cars for a distance of one mile; in 1931 this figure had been reduced to 137 pounds, a reduction of 30 per cent.

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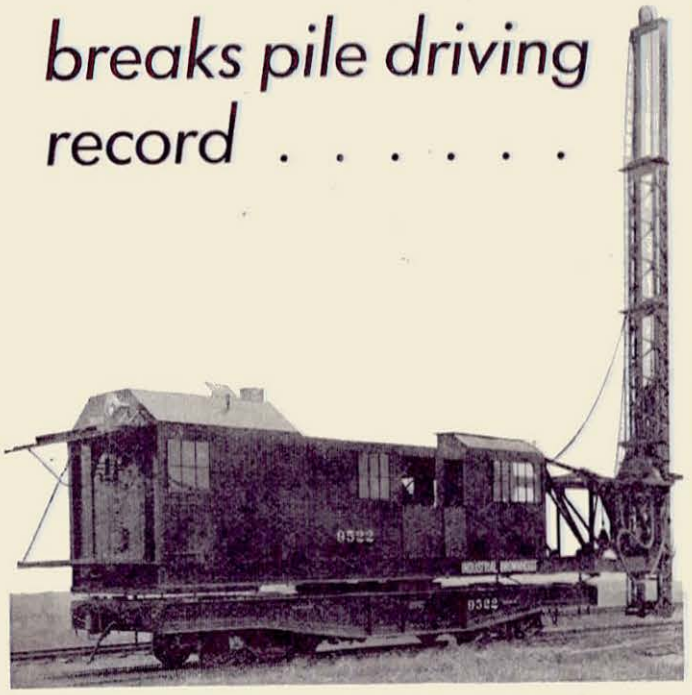

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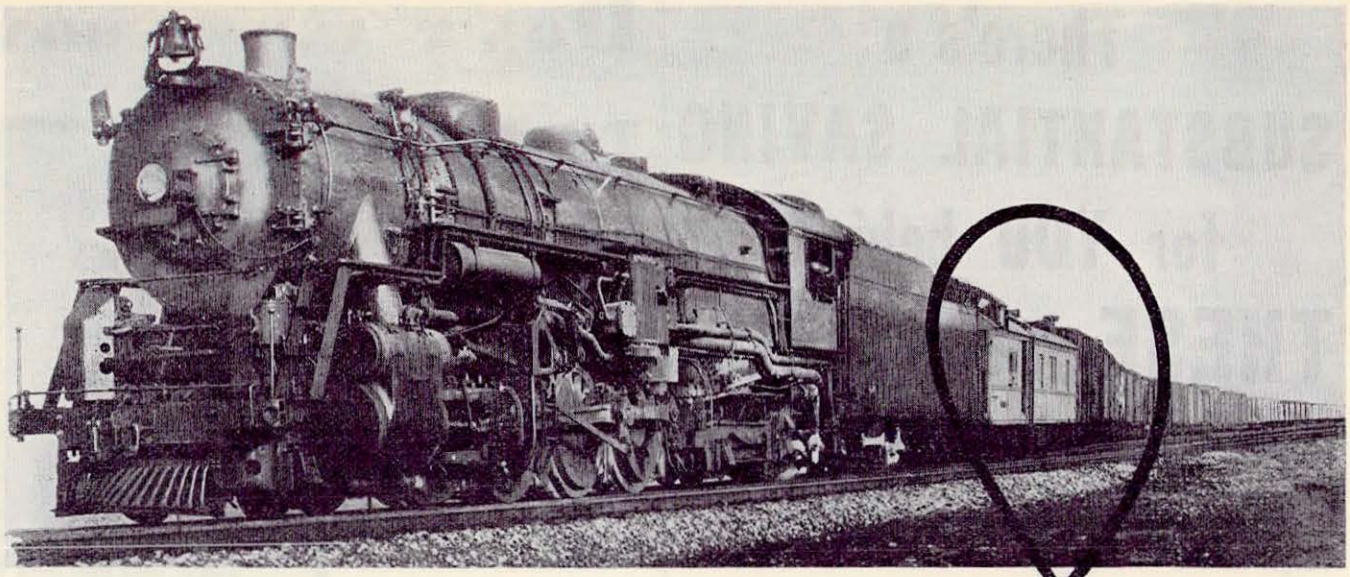

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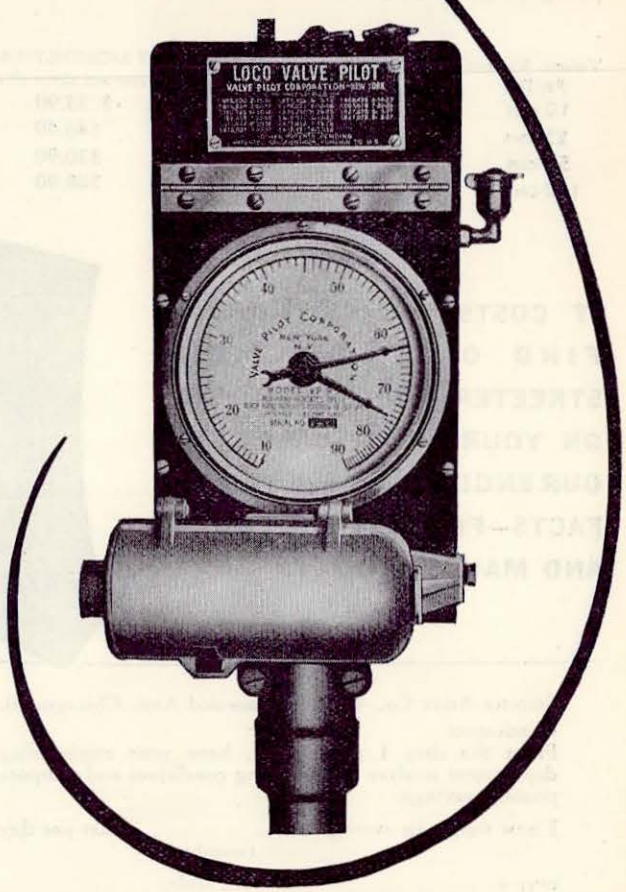

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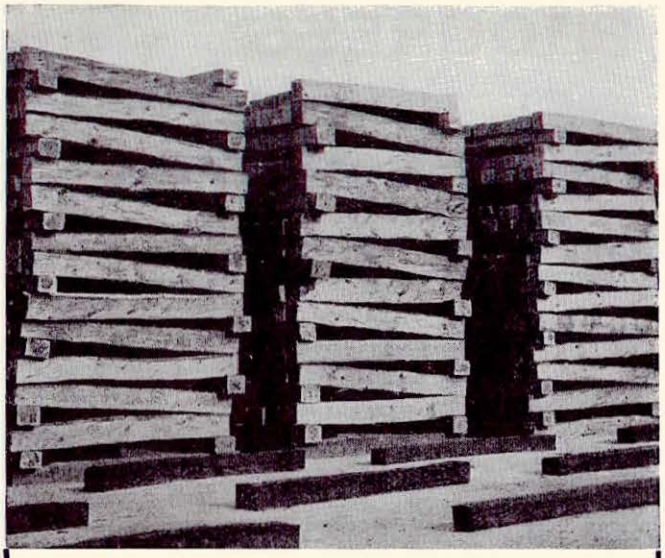

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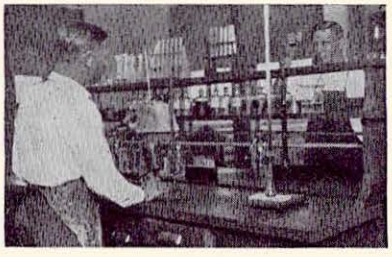

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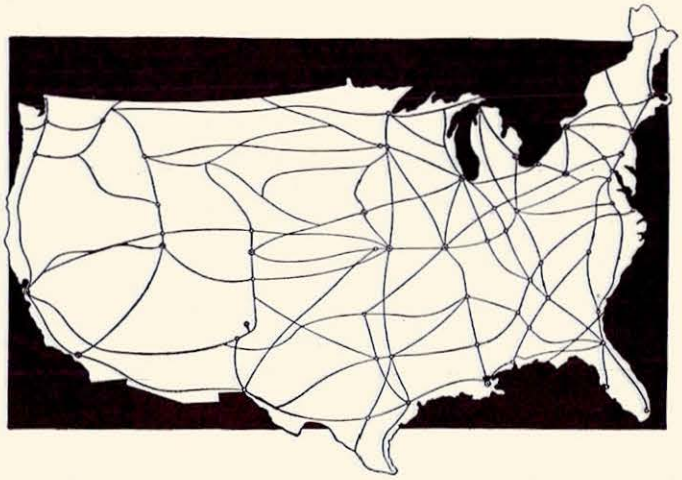

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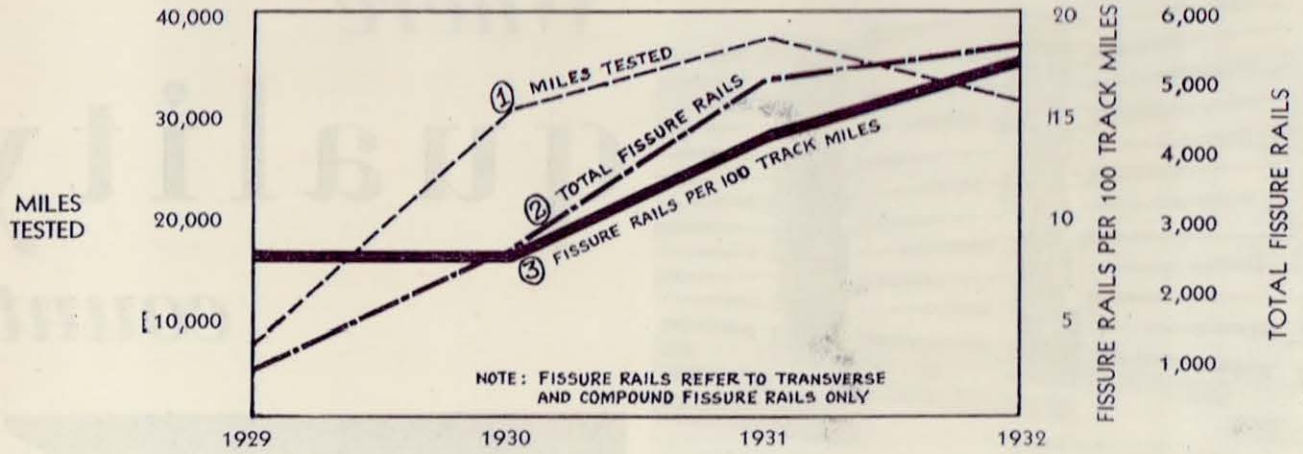

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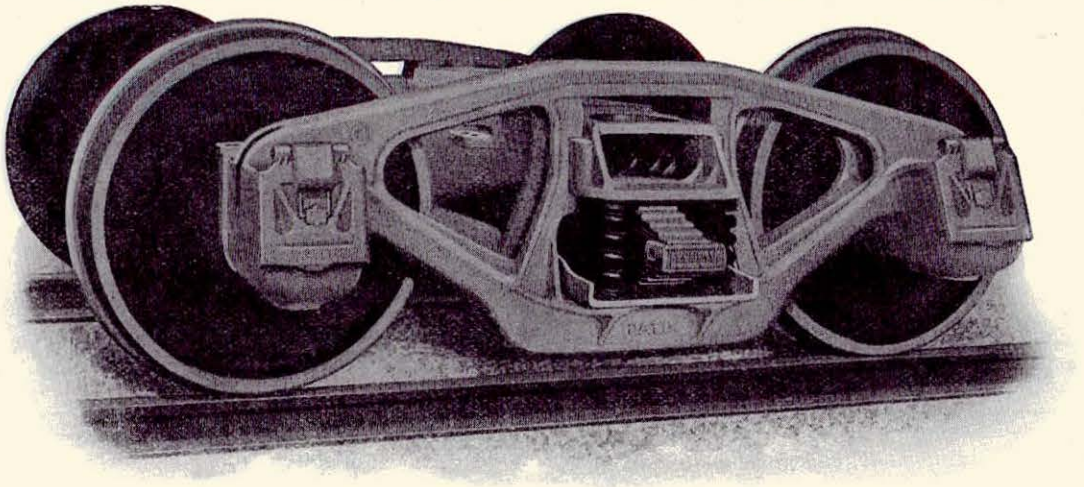

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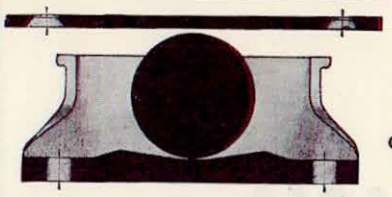

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Over this single track line are moved the trains of three different roads. In the busy season, as many as sixty trains per day have been operated. On a part of the C. T. C. section, 23 miles, the traffic density (net ton miles, revenue and non-revenue, per mile of road per annum) was 6,371,000.

The C. T. C. was installed for the purpose of reducing the delays incident to the high traffic density of the line and reducing freight train costs.

Some of the economic results are as follows:

Gross ton miles increased 6 per cent.

Train miles per train hour (speed) increased 47 per cent.

Gross ton miles per train hour increased 57 per cent.

Cost per 1000 gross ton miles decreased 39 per cent.

Locomotive tractive effort, no change.

This installation of C. T. C., judged by the improvement in freight train performance and the decreased freight train costs, may be regarded as a notable example of a self-liquidating project.*

* See report of Committee X published in bulletin 350 of the American Railway Engineering Association, October, 1932, p. 266.

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